User Manual

Table of Contents

Working with Qulu 1

Opening and Closing Qulu Client 1
Connecting to Qulu via Web-Client 3
Launching Qulu in Compatibility Mode 4
Connecting to Enterprise Controller and Working Offline 6
Introducing User Roles 9
Qulu User Interface Overview 10
Main Menu 12
Showing and Hiding Side Panels 13
Tabs and Layouts 13
Context Menu 14
Items on Layouts and Scene 15
Working with Resource Tree and Renaming Resources 18
Search 21
Playback Panel 22
Full Screen and Window Mode 23
Getting Context Help 23
Customizing Look and Feel of Qulu 24
Qulu Quick Start 26
Obtaining and Activating Qulu Licenses 27
Obtaining and Configuring Media Server's Additional Settings (Admin Only) 30
Configuring Media Server Storages (Admin Only) 32
Deleting Media Server (Admin Only) 33
Monitoring Media Servers (Admin Only) 34
Cameras and Encoders Management 36
Viewing Full Camera List 37
Adding Cameras and Encoders 39
Discovering Cameras Automatically 39
Disabling Automatic Discovery (Admin Only) 40
Adding Cameras and Encoders Manually (Admin Only) 41
Adding RTSP or HTTP Streams as Cameras (Admin Only) 44
Setting Up Cameras 45
Setting up Analog Cameras 46
Renaming Cameras (Admin Only) 47
Obtaining Camera's IP, MAC, Firmware and Model 48
Configuring Audio on Camera 49
Configuring Camera's Authentication 50
Forcing Aspect Ratio for Cameras 51
Setting Up Fish-Eye Cameras 52
Setting up PTZ on PTZ and Fish-Eye Cameras 55
Saving and Restoring PTZ Positions 57
Setting Up PTZ Tours 60
Home Positions and Tours for PTZ and Fish-Eye Cameras 63
Setting up Recording Schedule 64
Dual Stream Recording Specifics (RADASS) 65
Modifying Recording Schedule 65

Copying Recording Schedule between Cameras ... 69
Setting up Motion Mask and Motion Sensitivity ... 70
Configuring Proprietary Camera Parameters ... 73
Resetting Camera ... 74
Adjusting Secondary Stream Quality ... 75
Preventing Qulu from Changing Camera Streaming Settings (Admin Only) ... 76
Setting Same Parameters for Multiple Cameras ... 77
Swapping Cameras between Media Servers (Admin Only) ... 79
Deleting Cameras (Admin Only) ... 80
Configuring Events and Actions (Admin Only) ... 81
Tracked Events ... 84
Setting up Schedule for Tracking Events ... 85
Motion on Camera ... 86
Camera Disconnection/Malfunction ... 88
Storage Failure ... 91
Network Issue ... 92
Camera IP Conflict ... 92
Input Signal on Camera ... 93
Media Server Failure ... 94
Media Servers Conflict ... 95
EC Connection Lost ... 95
Licenses are not Configured ... 95
E-mail is not Set for Users ... 96
E-Mail Server is not Configured ... 96
Error while Sending E-Mail ... 96
Storages are not Configured ... 97
Media Server Started ... 97
Actions that Qulu Can Do ... 98
Notifications ... 99
Visual Event Indication ... 103
Mail Notifications ... 104
Configuring Mail Server for E-Mail Notifications ... 106
Start Recording on Camera ... 108
Start Panic Recording ... 110
Trigger Camera Output ... 111
Play Sound ... 113
Repeat Sound ... 115
Say Text ... 117
Write to Log ... 117
Default Rules ... 118
Viewing Events Log ... 119
User Management ... 122
Creating New User (Admin Only) ... 122
Changing User Settings ... 123
Deleting User (Admin Only) ... 123
Layout Management ... 124
Creating New Layout ... 125
Setting up Layouts ... 127
Adding Items to Layouts ... 128
Removing Item(s) from Layouts ... 130
Using Backrounds (Maps or Plans) on Layout (E-Mapping) ... 131
Adjusting Layout's Appearance ... 134
Selecting Items ... 135

Zooming while Working with Layouts ... 136
Moving and Swapping Items within Scene ... 136
Resizing Items within Scene ... 138
Using Fit In View ... 139
Changing Distance between Items ... 140
Changing Cell Aspect Ratio ... 140
Zoom Windows ... 141
Locking Layouts ... 142
Working with Several Qulu Windows ... 143
Saving Layouts ... 144
Assigning Layouts to Users (Admin Only) ... 145
Deleting Layouts (Admin Only) ... 145
Opening and Closing Saved Layouts ... 146
Backing up and Restoring Qulu Database ... 147
Playback in Qulu ... 148
Watching Cameras in Qulu ... 149
CPU and Bandwidth Saving during Playback (RADASS) ... 150
Navigating through Archive and Live ... 152
Pan-Temporal Time Line ... 154
Navigating through Several Cameras Synchronously ... 156
Searching through Archive ... 157
Using Calendar ... 157
Performing Smart Motion Search ... 159
Using Thumbnails for Better Navigation ... 161
Preview Search ... 162
Playing Back Local Files in Qulu ... 164
Local files structure in Resource Tree ... 164
Configuring Media Folders ... 165
Opening Local Files Outside of Media Folders ... 167
Navigating Through Local Files ... 167
Forensic Analysis ... 167
Expanding Items to Fullscreen ... 168
Zoom ... 168
Rotate ... 169
De-warping Fish-Eye Cameras ... 170
De-warping Screenshots Taken from Fish-Eye Cameras ... 173
Image Enhancement ... 176
Exporting ... 178
Single Camera Export ... 179
Exporting Recorded Region from Single Camera ... 179
Viewing Videos Exported from Single Camera ... 182
Multi-Video Export ... 183
Exporting Layout in Multi-Video Format ... 184
Viewing Multi-Videos ... 187
Changing Multi-Videos after Export ... 188
Checking the Validity of Exported Videos ... 189
Taking Screenshots ... 191
Adjusting Volume ... 192
Tours ... 192
Screen Recording (Windows Only) ... 193
Setting up Screen Recording ... 194
Performing Screen Recording ... 196
Upgrading Qulu ... 197

Troubleshooting and Contacting Support 198

Diagnosing Offline Cameras 199
Restoring Broken Archive 200
Providing Remote Access 201
Recording Issue 201
Collecting Logs 202
Collecting Additional Information 203

Glossary 205

Working with Qulu

Opening and Closing Qulu Client

A few different ways are available to launch the application:

Windows

- From desktop: Qulu shortcut icon.
- From Start Menu: **Start –> Programs –> Vista CCTV –> Qulu**.
- Directly from the installed folder:
  - For **x86** default is `C:\Program Files(x86)\Vista CCTV\Qulu\Client\1.5\1.4\Qulu Launcher.exe`
  - For **x64** default is `C:\Program Files\Vista CCTV\Qulu\Client\Qulu Launcher.exe`

Linux

- Using Qulu shortcut icon.
- Directly from the installed folder: `/opt/vista/qulu/Client/1.4/Qulu Launcher.exe`

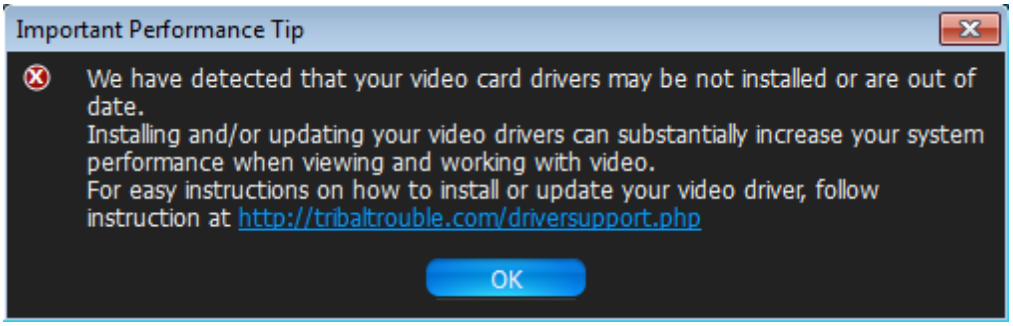
To close Qulu **Client**:

- Click on the " " button located in the top right corner
- Go to *Main Menu –> Exit* (or press ***Alt+F4***).

It is possible to set up Qulu **Client** to launch at start. To proceed:

1. Open Main Menu and go to *System Settings*.
2. Select *Run Application when PC boots up* (see *Misc* section).
3. Click *OK* when done or *Cancel* to discard changes.

IMPORTANT. In order to display video and graphics properly, it is important to have most current video drivers installed. If video drivers are not installed, the following will be displayed:


Important Performance Tip
We have detected that your video card drivers may be not installed or are out of date.
Installing and/or updating your video drivers can substantially increase your system performance when viewing and working with video.
For easy instructions on how to install or update your video driver, follow instruction at http://tribaltrouble.com/driversupport.php
OK

Finally, Qulu Client can detect PC configuration automatically. If CPU and/or graphic adapter are too weak to render all graphics, the configuration mode will be activated.

This mode restricts the following Client functionality:

- Only one video can be viewed in the same time
- No notifications in Client (see Notifications)
- All animations are turned off.

Connecting to Qulu via Web-Client

Qulu **Web Client** allows connecting to Qulu from any PC via web browser. The following browsers are supported:

- Internet Explorer 9
- Google Chrome
- Mozilla (not recommended)

To access **Web Client** do one of the following:

- If Qulu Client is not installed on the PC:
  1. Run the web browser.
  2. Enter the following URL:

  `https://<IP>:<PORT>/web` (**<IP>** and **<Port>** are IP Address and port of Enterprise Controller). For instance, to open Web Client on a local computer, use `https://localhost:7001/web`.
- If Qulu Client is installed on the PC and connected to Enterprise Controller:
  - go to Resource Tree, **Right Click** on the *System* node and select *Open Web Client...* (available for Admin Only)
  - open Main Menu and choose *Open Web Client...*

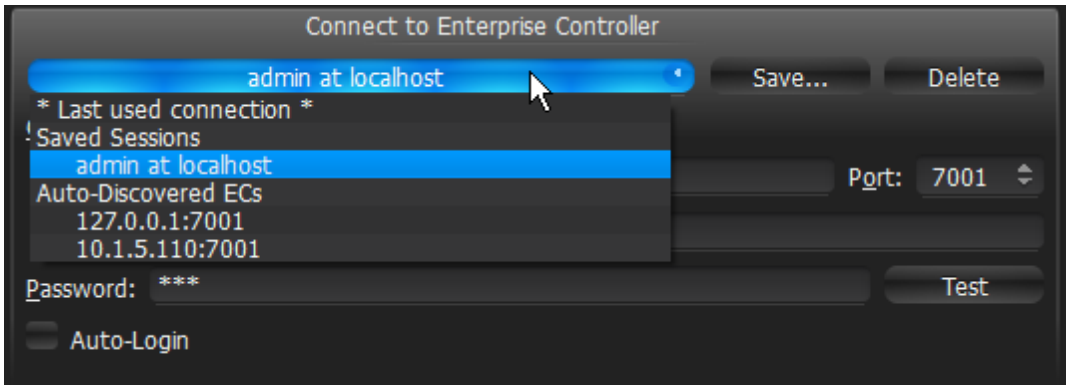
After Qulu **Web Client** opens , enter login and password.

The following operations are supported:

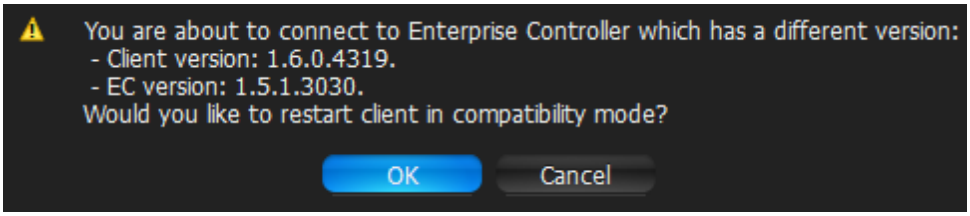
- Browsing the Cameras list (on the left-hand side)
- Viewing Camera (only one Camera can be viewed simultaneously)
- Browsing archive on Camera (incl. Calendar Search)

Launching Qulu in Compatibility Mode

It is necessary sometimes to connect to Enterprise Controller with different versions. A good example would be when Qulu is installed at multiple sites (home, work, etc.) and only one installation is upgraded. In this particular case, Enterprise Controllers will have different versions and one Client should connect to another Enterprise Controller (Client at home connects to Enterprise Controller at work). Enterprise Controllers of different versions are highlighted in red in login dialog:

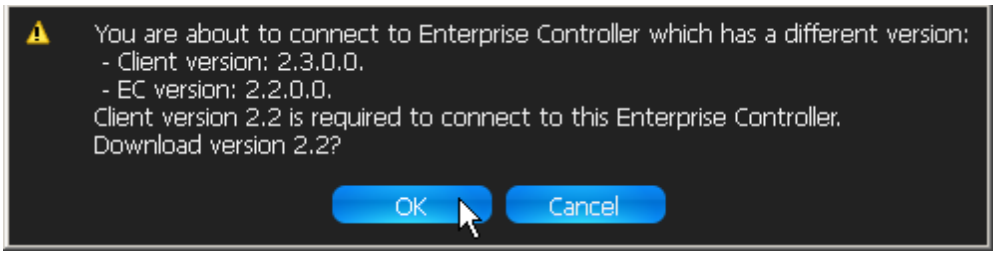


In this case, the following message will appear:


You are about to connect to Enterprise Controller which has a different version:
- Client version: 1.6.0.4319.
- EC version: 1.5.1.3030.
Would you like to restart client in compatibility mode?
OK
Cancel

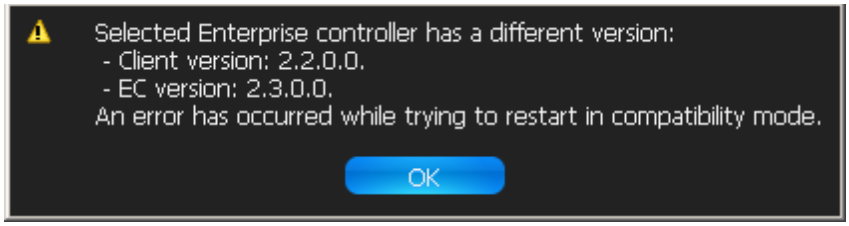
By clicking *OK*, the application will restart in compatibility mode.

In some instances, it may be necessary to download additional files for compatibility pack. In this particular instance, the following message will be displayed:


You are about to connect to Enterprise Controller which has a different version:
- Client version: 2.3.0.0.
- EC version: 2.2.0.0.
Client version 2.2 is required to connect to this Enterprise Controller.
Download version 2.2?
OK
Cancel

Once download is completed, restart is suggested.

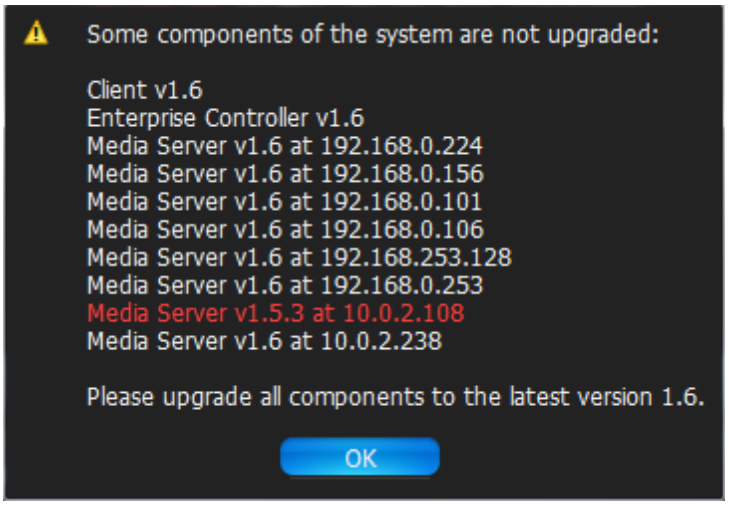
IMPORTANT. It is not possible to connect to the next version of Enterprise Controller at the moment:


Selected Enterprise controller has a different version:
- Client version: 2.2.0.0.
- EC version: 2.3.0.0.
An error has occurred while trying to restart in compatibility mode.
OK

In this case it is important to upgrade Qulu to its current version.

Note: Qulu recalls the Enterprise Controller it was lastly connected to and automatically suggests compatibility mode for the next launch.

IMPORTANT. If some of the components such as Enterprise Controller, Media Servers or Client have different versions installed, it may cause potential issues. When Client is connected to EC, all component versions are checked. The following will appear if the component versions differ from one another:


Some components of the system are not upgraded:
Client v1.6
Enterprise Controller v1.6
Media Server v1.6 at 192.168.0.224
Media Server v1.6 at 192.168.0.156
Media Server v1.6 at 192.168.0.101
Media Server v1.6 at 192.168.0.106
Media Server v1.6 at 192.168.253.128
Media Server v1.6 at 192.168.0.253
Media Server v1.5.3 at 10.0.2.108
Media Server v1.6 at 10.0.2.238
Please upgrade all components to the latest version 1.6.
OK

It is recommended to have the same version installed on all system components.

Connecting to Enterprise Controller and Working Offline

In order to gain access to **Media Server** and **Cameras**, a user must be connected to **Enterprise Controller** (**EC**).

The connection to **Enterprise Controller** can be established by pressing the *Connect* button (or) or via Main Menu –> *Connect to (Another) Server*.

The current connection status is indicated by the color of the **Connect** button:

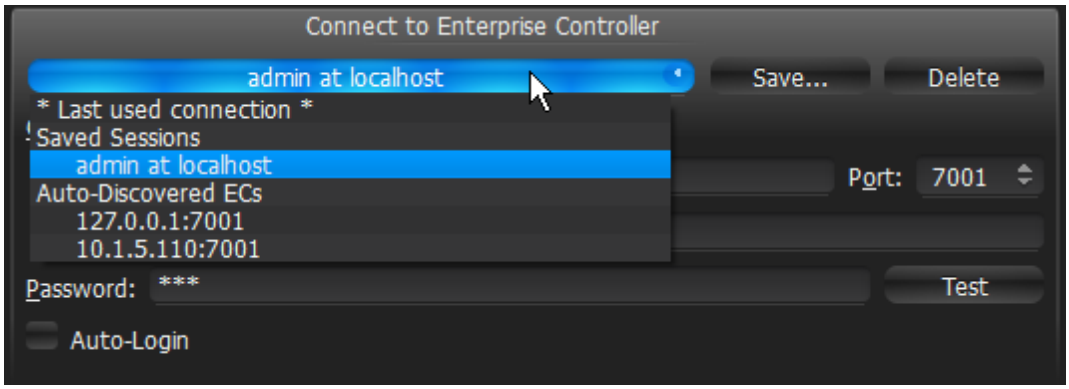
– connected

– disconnected

The connection dialog is displayed as follows:

Qulu provides a powerful mechanism that can auto-discover **Enterprise Controllers** in **local network**. The easiest way to connect to EC is to use one of the auto-discovered EC.

To use predefined connections, click on the drop-down list. By default ,**Last Used Connection** is recommended:



Note: the computer EC is installed on may have several network interfaces. In this case, any available is displayed on the *Auto-Discovered ECs* list.

Note that Enterprise Controllers with different versions are discovered automatically as well. However, they will be displayed in red. It is possible to connect to them in a compatibility mode (see "Launching Qulu in Compatibility Mode").

Connection details can also be inputted manually. The following values must be entered:

- *Host* – IP Address or name of the computer EC is installed on (`localhost` or `127.0.0.1` for All-in-One installation).
- *Port* – IP Port for access to EC (`7001` by default).
- *Login* and *Password* to connect to EC. If connecting for the first time, "`admin`" should be used as a login name. Use the same password that was set up during the initial installation.

To check connectivity to EC, press *Test*. If ok, access is granted. The following may cause connection errors:

- EC is not available:
  - specified IP Address is incorrect or inaccessible
  - specified port is incorrect
  - EC is stopped
- login and/or password are incorrect
- EC and Client are incompatible with each other (different customizations).

To save login details, select the *Auto-Login* option on the bottom. When Client is launched again, it will connect to the EC automatically through the pre-established login and password combination.

To save and restore connection details:

- If current connection details are used, press Save and create a connection name to store, which will appear in the drop-down list next time a user logs in.
- To delete details of a stored connection, select it from the drop-down list and press Delete.
- If the last connection was not properly saved, the software will use its connection data from the next launch (* *Last Used Connection* *).

Note: passwords are not stored in saved connection details.

To log out, go to Main Menu and choose *Logout*.

If **Client** is not connected to **Enterprise Controller**, a user can only access **Local Files** (see "Playing Back Local Files in Qulu").

To connect to a different EC under a different user, open the login window and enter new EC coordinates or login credentials. If canceled, the current user will still be connected to Enterprise Controller.

Introducing User Roles

There are three types of user roles in Qulu:

- **Owner** (user with "**admin**" login). Unlimited control. This user cannot be deleted.
- **Administrator**. Full control, except:
  - Change **Super Administrator (admin)** settings
  - Delete or change own role
- **Viewers** (**Live Viewer**, **Viewer**, **Advanced Viewer**). Limited control. A viewer cannot:
  - Manage users (except for changing their own password).
  - See servers and all connected cameras. Only the cameras assigned by the administrator are visible.
  - Change predefined layouts (layouts can be changed, but cannot be saved); however, it is possible to configure and save own layouts based on available resources (assigned cameras and local files).

Additional permissions can be assigned to users to be able to operate with available cameras (assigned by **Administrator**):

	ADMIN	CAMERA SETTINGS	PTZ CONTROLS	VIDEO ARCHIVES	EXPORT VIDEO	VIEW LIVE VIDEO
Administrator	●	●	●	●	●	●
Advanced Viewer		●	●	●	●	●
Viewer				●	●	●
Live Viewer						●

- View archive, perform search and forensic analysis
- Perform export from archives
- Set up cameras
- Set up PTZ on cameras.

If none of these permissions are assigned, a user can only view live videos on available cameras.

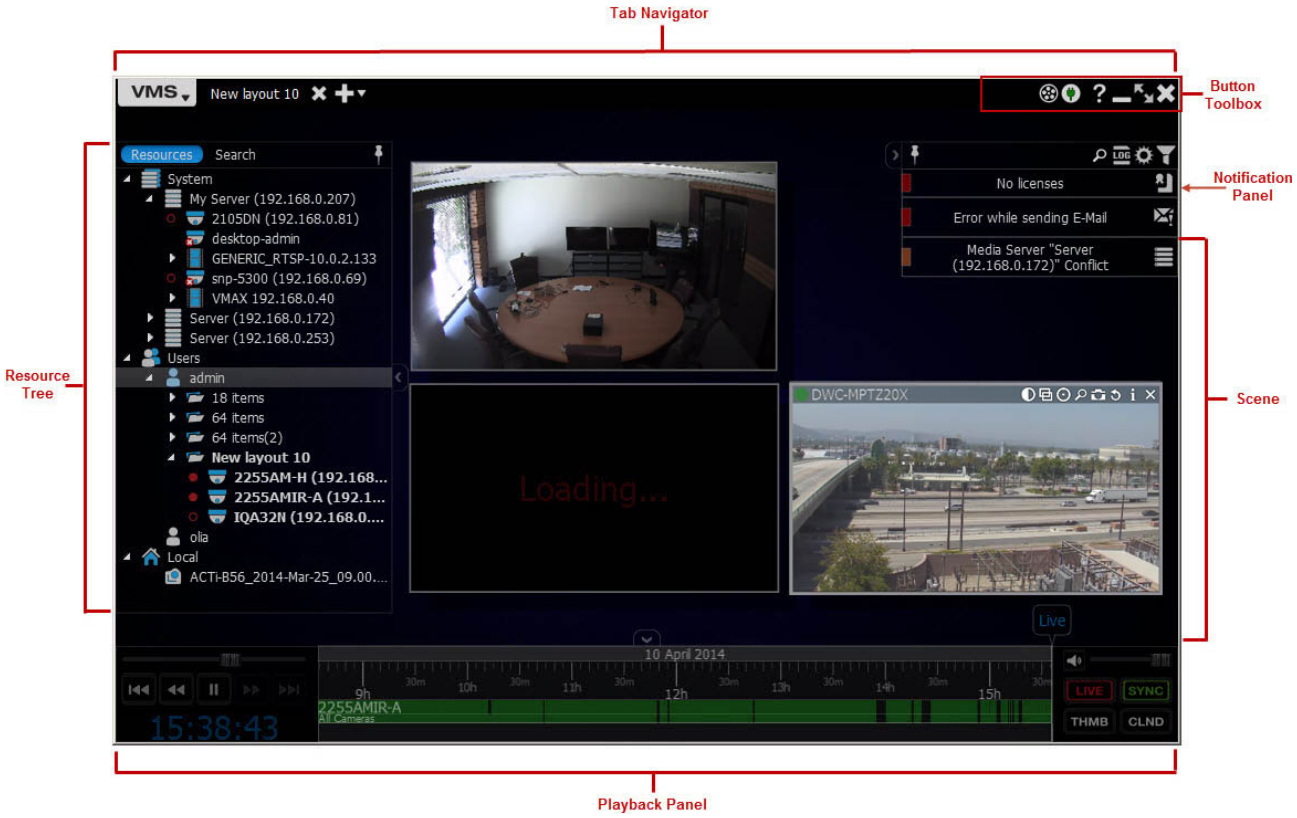
IMPORTANT. If any action or graphical element described in this document is not available to a specific user level, the following will apply (**Admin only**). If the action described in this document is unavailable to certain roles, it will be indicated in the corresponding topic.

The following represents a standard flow:

1. **Super Administrator** creates and configures all layouts for own use.
2. **Super Administrator** creates several users with a **Viewer** role.
3. **Super Administrator** creates and configures layouts for each **Viewer.**
4. **Viewer** logs into Qulu and is only able to work with assigned layouts and cameras.

Qulu User Interface Overview

Qulu **User Interface (UI)** includes the following main controls:



- **Scene** (main view). Displays video items from cameras or local files.
- Tab Navigator (top Panel). It contains Main Menu, Tabs and the following buttons:
  - Connect/Disconnect button. This button indicates the current connection status and allows to connect or disconnect from EC.
  - **Window Buttons** (go/exit fullscreen, minimize, close window)
  - Screen Recording button. Starts/stops screen recording
- Playback Panel (located on the bottom Panel). Used for playing back local videos and live streams.
- Resource Tree (left Panel). Contains all servers, cameras, local files, users and layouts available to the current user.
- Notifications (right Panel). Contains notifications about system events.

Scene represents space for video Items can be placed on. Qulu allows viewing streams from **Cameras** as well as **Local Video Files**.

Items are placed on **Scene** and can be saved as Layouts.

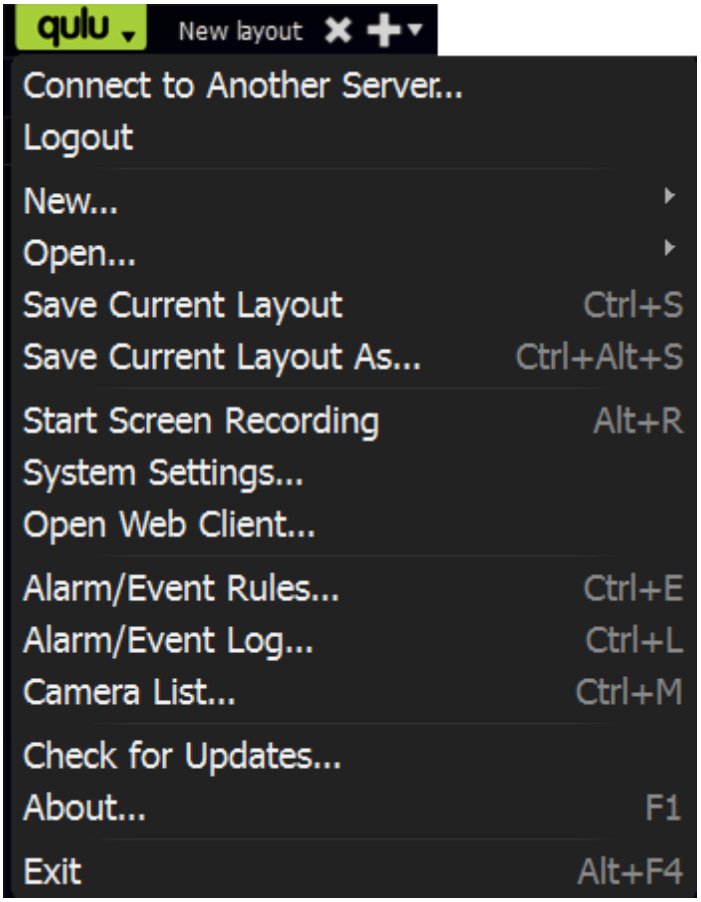
If several **Tabs** are opened, then each Tab contains its own Layout with **Items**:

Main Menu

Main Menu allows users to gain access to various Qulu features quickly and intuitively. **Main Menu** can be opened by clicking on the logo at the upper left corner:

Main Menu contains the following items:

- *Connect to (Another) Server* – allows connecting/disconnecting to/from Enterprise Controller (see "Connecting to Enterprise Controller and Working Offline")
- Logout -
- *New*:
  - *Tab* – creates an empty tab in Tab Navigator (see "Tabs")
  - *Window* – opens a new window of Qulu (see "Working with Multiple Qulu Windows")
  - *User* – creates a new user (see "User Management").



- *Open* – opens and plays back **Local Files** (see "Playing Back Local Files in Qulu"):
  - *File* – opens **Local Video File**
  - *Folder* – opens all **Local Video Files** in the selected folder and plays them back simultaneously (max **24** files for **x86** and max **64** files for **x64**).
- *Save Current Layout* and *Save Current Layout as...* – the currently displayed on the scene layout ("Saving Layouts").
- *Start/Stop Screen recording* (see "Screen Recording (Windows Only)").
- *Go to/Exit Fullscreen* (see "Full Screen and Window Mode").
- *System Settings* – setup Qulu.
- *Exit*.

Showing and Hiding Side Panels

Side Panels are extremely useful, though may be hidden by a user if needed. The buttons show/hide **Panels** as well as *Hide Panel* Context Menu item.

If an item is expanded to fullscreen (see "Expanding Items to Fullscreen"), all **Panels** slide off the screen and disappear.

To bring **Panel** back, click on .

Additionally, both left and right sliding menu panels can be pinned ( ):

- If **Pinned**: side **Panels** are always visible. If a panel is hidden manually, it will not reappear automatically.
- If **Unpinned**: **Panel** is only visible when the cursor is on. As soon as a user clicks off the **Panel**, the panel will disappear. **Panel** can reappear if a user points or clicks on .

F11 hides all **Panels**. To undo, press ***F11*** again or use ***Esc*** (toggle Fullscreen will also apply if hit ***Esc***).

Tabs and Layouts

Tabs are used to make layout navigation easier. Each **Tab** hosts a separate **Layout**. Tabs function very similar to any Internet browser.

The following actions can be performed with **Tabs**:

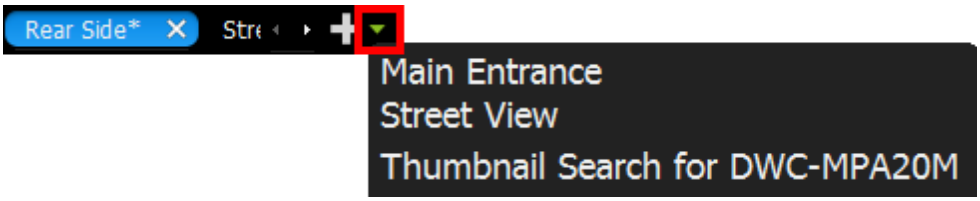
- Open a new tab:
  - **Tab Navigator**'s Context Menu –> *New Tab* (***Ctrl+T***)
  - Main Menu –> *New* –> *Tab*
  -
- Close a specific **Tab**: **Tab**'s Context Menu –> *Close* (***Ctrl+W***)
- Keep one **Tab** open – **Tab**'s Context Menu –> *Close All but This*
- Change the tab order – switch position by dragging and dropping a tab in the desired order.

IMPORTANT: A warning message will appear every time **Tab** is modified, suggesting to the user to save changes. See "Saving Layouts".

If too many **Tabs** are opened at the same time, scrolling arrows will appear:

These arrows can be used to scroll **Tabs** left and right.

To navigate to a specific **Tab** or open a saved layout, use the button located on the right (next to):



Initially, no **Layouts** are configured in the system. An empty default **Tab** is shown ("**`New Layout`**"). If **User** tries to configure **Layout** in this **Tab**, asterisk will automatically be added to the caption (indicating a **Layout** change). The **Layout** will remain **local**.

The layout information is automatically passed to **Enterprise Controller** once **Layout** is saved (See "Saving Layouts"). If **Layout** is saved successfully, it will be displayed in Resource Tree under the current **User**.

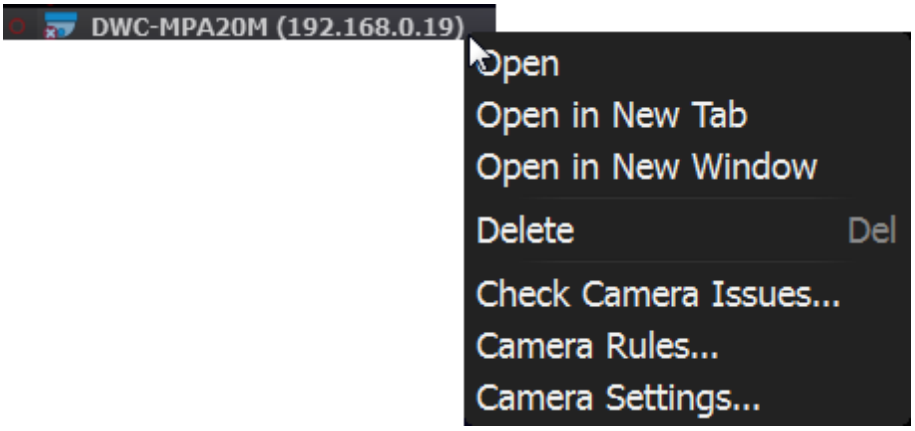
When closing all **Layouts**, the default blank **Tab** will still appear. If the current **Layout** is saved as "**`New Layout`**", the blank **Tab** located next to it will be renamed "**`New Layout 1`**" automatically.

Any saved **Layouts** that were previously opened, will appear automatically once **User** logs in.

See "Layout Management" and specifically "Setting up Layout" sections for more details.

Context Menu

Context Menu displays all available actions as they relate to the selected element. **Context Menu** will appear by right-clicking on the desired element (or on empty space).



Items on Layouts and Scene

Video Item represents video recorded by a camera that can be played back within Qulu.

Items displayed on **Scene** offer total video manipulation, a variety of features, streaming data and other related information.

Local videos are displayed as follows:

The file name is displayed in the upper left corner of **Local Video Item**.

The following buttons are displayed in the upper right corner of **Local Video Item**:

- – Image Enhancement
- – create Zoom Window (see Zoom Windows)
- – take screenshot fron the item (see Taking Screenshots)
- – Rotation (see "Rotate")
- – Information: displays additional information about the current stream (see below)
- – Close (removes the item from the current layout)

Streams from cameras are displayed as follows:

The following information is displayed in the upper left corner of the camera item:

- Camera **Name**
- Current **Recording Mode** (**Camera** may be recording differently depending on its schedule):
  - – **Recording Always** (green circle)
  - – **Motion Recording** (red circle)
  - – **Low Resolution** - always, **High Resolution** - only while in motion (red circle crossed green)
  - – **Not Recording** (grey circle)

  For more information on recording settings, see "Setting up Recording Schedule".

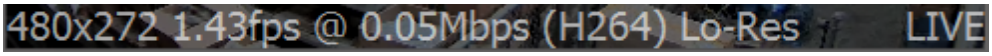
The following buttons are displayed in the upper right corner of **Camera** in addition to those displayed for local video:

- – applies de-warping (is displayed if this is a fish-eye lens camera) – see "De-warping Fish-Eye Cameras"
- – PTZ (if camera supports) – see "Setting up PTZ on PTZ and Fish-Eye Cameras"
- – Smart Search – see "Performing Smart Motion Search".

The following information can be useful during camera setup to help adjust to the desired FPS and bitrate. It may also be useful for monitoring local files.

To view item information, click on located in the top right corner of the item. To view information on multiple items at a time, select **Items** (see "Selecting Items"), open Context Menu and choose *Show Info* (***Alt+i***).

The following data will appear on the bottom:



- Current **Resolution** of the stream
- Current **FPS** of the stream
- Current **Bitrate**
- Current stream **Codec** (**H264** or **MJPEG**)
- Current **Resolution** (if **Dual-Streaming** is enabled for the camera): *Hi-Res* or *Lo-Res*
- Current **Time** of video playback or *LIVE* if viewing live from a camera

Additionally, the following messages may appear for camera items:

- **NO SIGNAL** – camera is offline. It is possible to diagnose Camera in this case (see "Diagnosing Offline Cameras").
- **NO DATA** – no recording was performed. No data available.
- **Loading...** – awaiting data from Media Server
- **Unauthorized** – incorrect/missing login or password

Working with Resource Tree and Renaming Resources

Resource Tree is a convenient tool to display, search and manage available resources within the application. The format of **Resource Tree** depends on the current user's permission level.

Resource Tree is displayed on the left Panel. It can be resized by dragging the right edge to the left or right.

Depending on a user level (see "Introducing User Roles") it may contain different elements. For **Administrators, Resource Tree** is displayed as follows:

- **Servers** (admin only) – a list of servers registered in the system. Server IP addresses are also displayed (if the corresponding setting is enabled).

  Note: **Media Server** can have several network interfaces, so different IP addresses may be displayed.

- **Cameras**. Cameras are displayed under **Servers** (admin only) and **Layouts**. If a camera appears on more than one layout, the camera will be listed multiple times in **Resource Tree**.

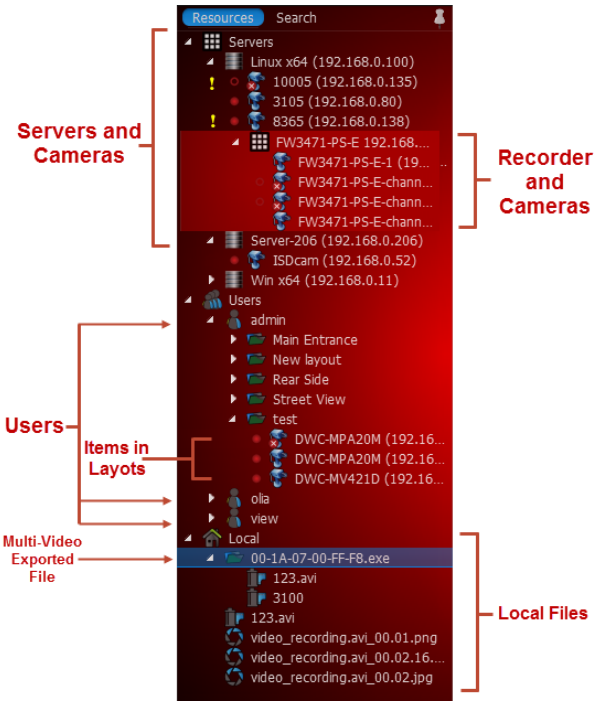
  The following indicators are displayed on the left:

  ● – a camera is in recording mode

  ○ – recording is set up for the camera, but not recording at the moment.

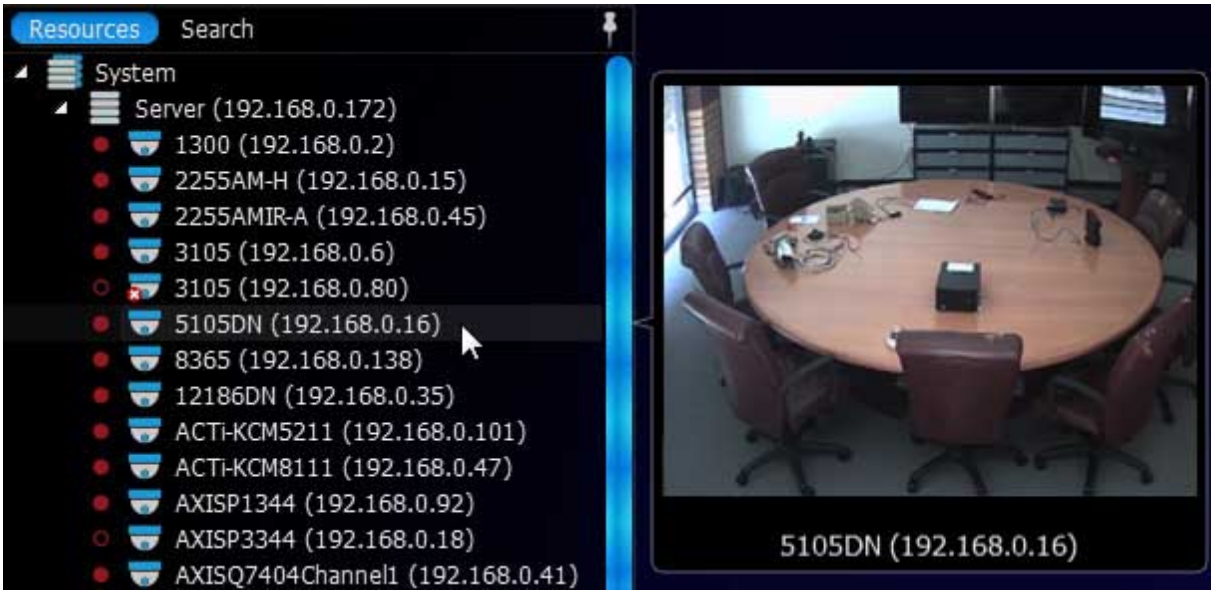
  Additionally **Cameras**' IP addresses are displayed (if the setting is enabled, see below).

  If **Camera** is experiencing network issues over the past minute, is displayed. See "Camera Disconnection/Malfunction" for details.



- **Recorders** (admin only)**.** Displayed under **Servers** (admin only) and contains several channels (represented as **Cameras**).
- **Users** (**Administrator** can view several users in **Resource Tree**).
- **Layouts**. Contains resources (cameras and local files). Owned by users and displayed under each user.
- **Local Files**. Contains the following:
  - **Video files**
  - **Images**
  - **Exported Video Files** (see "Exporting")
  - **Exported Multi-Video Files** and their contents: **Cameras**, or **Local Files** (see "Exporting the Layout in Multi-Video Format"
  - **Screen Recordings** (see "Screen Recording")
  - **Screenshots** (see "Taking a Screenshot").

When hovering over **Camera** with a mouse cursor, a thumbnail of a frame taken from the **Camera** will appear:

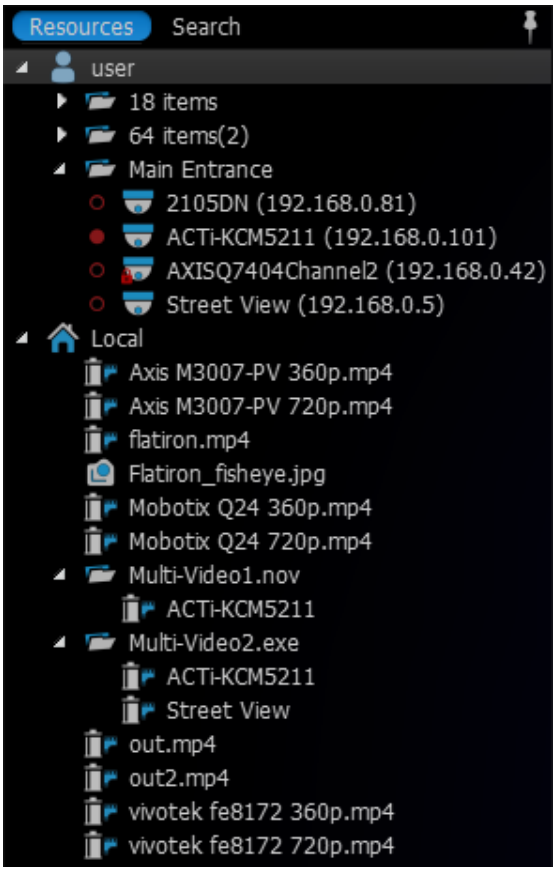


Items that are currently placed on **Scene** are highlighted in bold in **Resource Tree**. A selected (focused) Item it has the">" mark in both **Server** and **Layout** sections.

To enable/disable displaying IP addresses in **Resource Tree**:

1. Open Main Menu and go to *System Settings*
2. Select/clear the flag in *Show IP in Tree* option (*Look and Feel* section).

Viewer's **Resource Tree** is shown as the following (see picture at the right-hand side):



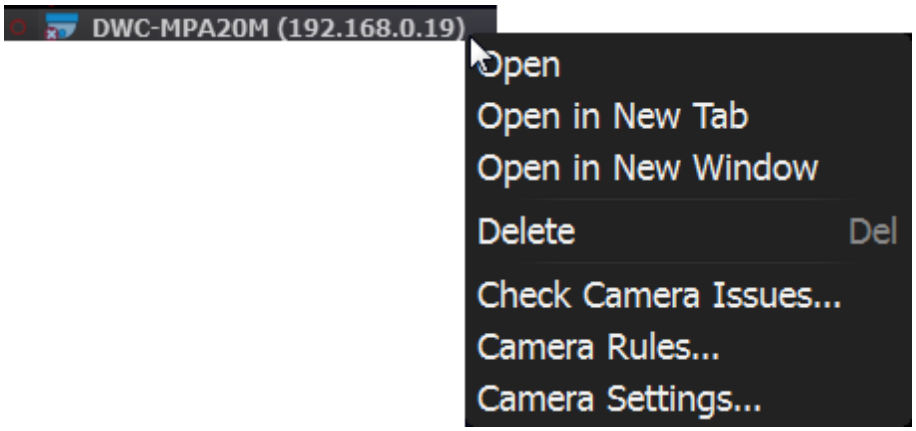
If **Client** is not connected to **Enterprise Controller**, only **Local File** names are visible.

The following actions can be performed in **Resource Tree**:

- **Expanding/collapsing** a tree node (+/- on keypad)
- **Scrolling** (if the tree contains multiple elements)
- **Multi-Selection**. Shift to select multiple items and hold Ctrl to select/deselect items individually.
- **Drag and drop**. An efficient way to organize and configure resources in the tree. The following chapters will further explain the drag and drop capabilities.
- Search.

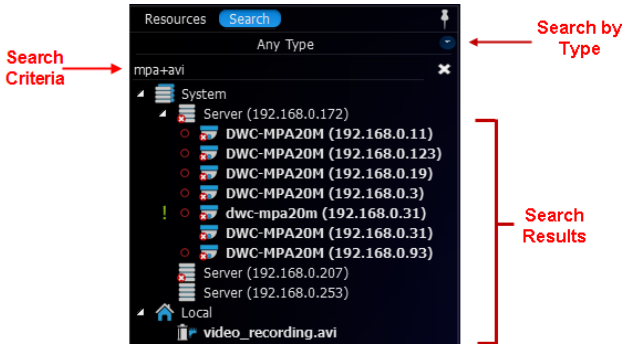
Almost any resource (except **Local Files**) can be renamed by **Administrator** in **Resource Tree**. To rename a resource, simply select it and:

- **Left-Click** on it again (like Windows Explorer).
- **Right-Click** for Context Menu and choose *Rename* (or press ***F2***):



Search

Qulu provides fast, powerful and flexible search engine that enables users to quickly locate the desired items on demand. To perform search, click on the *Search* tab in Resource Tree next to *Resources*.



IMPORTANT: Search results will appear on Scene immediately. If the search comes back with a high number of found items, only the first 24 will be displayed for x86 architecture and 64 results - for x64 architecture. Search results are automatically added to the current scene.

Type any three consecutive characters from a resource name, MAC or IP into the box to activate search. Search results are displayed as follows:

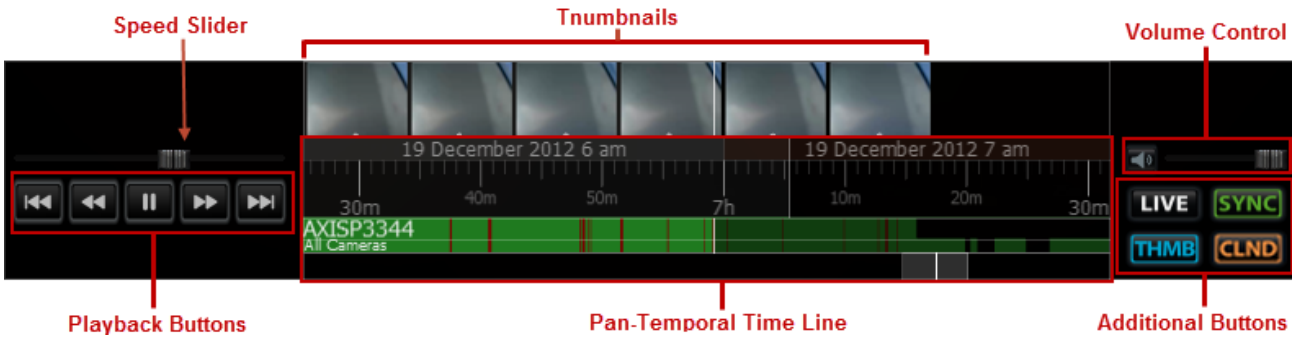
To refine search, use the following tips:

- Specify the resource type: *Any Type*, *Video Files*, *Image Files* or *Live Cameras*.
- Use special symbols to combine several search criteria:
  - "+" – to add a new criteria to the search. Example, "**out**" + "**100**" will pull in all files containing "**out**" or "**100**" in file description.
  - "\" – to avoid files containing certain characters. Example, "**out \hdtv**" will pull in all files containing "**out**", but no "**hdtv**".

All results will disappear from the scene once all characters are removed from the search box.

Playback Panel

Qulu provides powerful and intuitive playback system. It includes seamless transition from live to archived footage, smooth archive playback, extensive search capabilities, local files playback, etc. All playback operations can be performed within the **Playback Panel**:



The following elements are displayed:

- **Playback Buttons** – used for playing back selected **Item**(s)
- **Speed Slider** – controls the playback speed of selected **Item**(s)
- Pan-Temporal Time Line – represents the archived data for selected **Item**(s)
- Volume Control – used to adjust volume for the selected **Item**
- **Additional Buttons**:
  - LIVE – switches selected camera(s) to a live playback mode or indicates that they are playing live. See "Navigating through Archive and Live"
  - SYNC – performs time synchronization of all cameras displayed on **Scene**. See "Navigating through Several Cameras Synchronously"
  - CLND – opens calendar to help navigate through archive (see "Using Calendar")
  - THMB – expands Time Line and shows small previews called **Thumbnails**. See "Using Thumbnails for Better Navigation".

Full Screen and Window Mode

Qulu is recommended to be operated in full screen. To toggle full screen or bring the application to a window mode:

- and buttons
- ***Alt + Enter*** or ***Esc***
- ***F11*** (all side panels will be hidden).

Moreover it is possible to expand a single item on fullscreen. See "Expanding Items to Fullscreen".

Getting Context Help

Qulu provides intuitive context help system on each interface element.

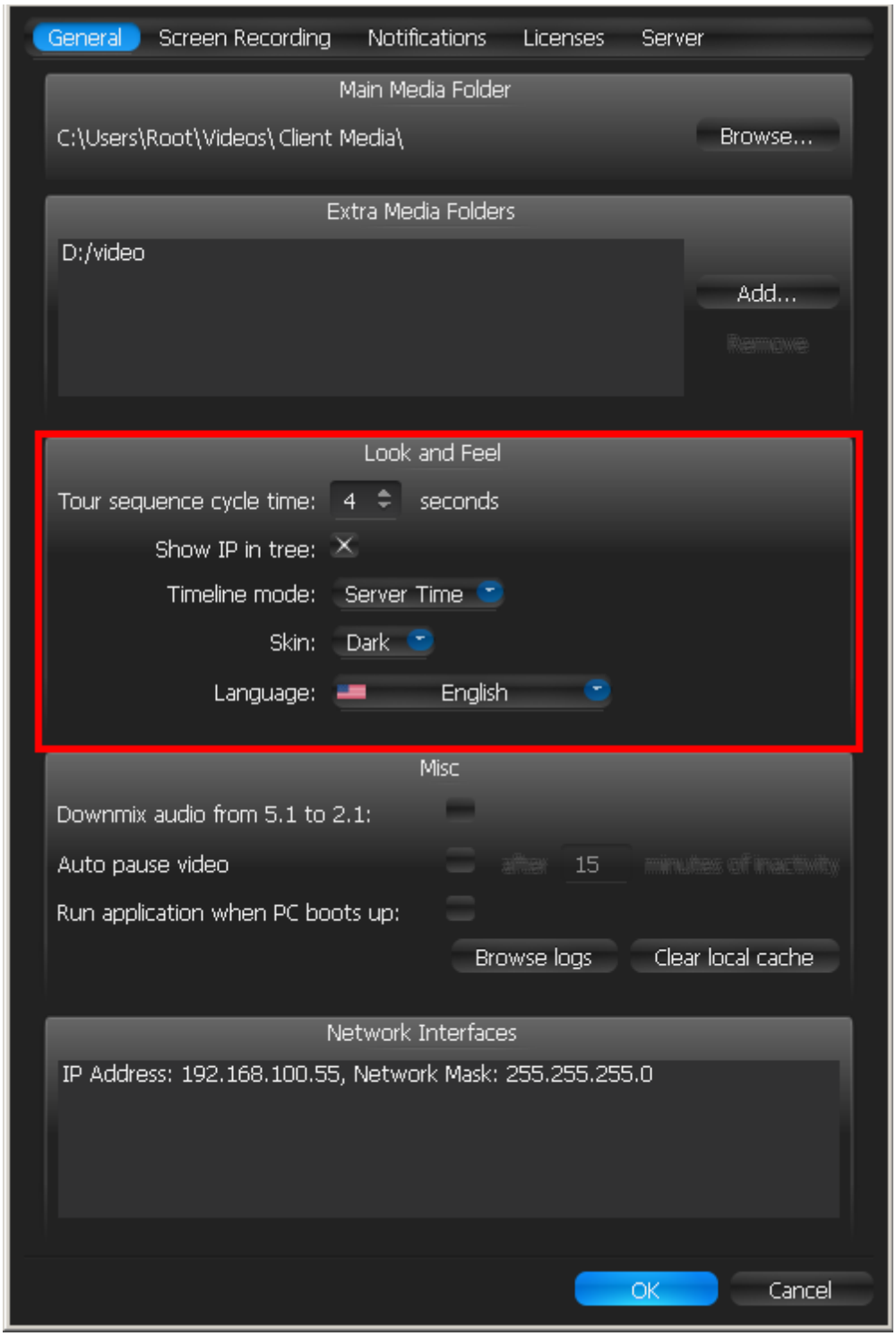
To invoke help:

1. Press button.
2. **Left-Click** on the desired interface elements.

Context Help contains links to other topics that can be useful as well.

Customizing Look and Feel of Qulu

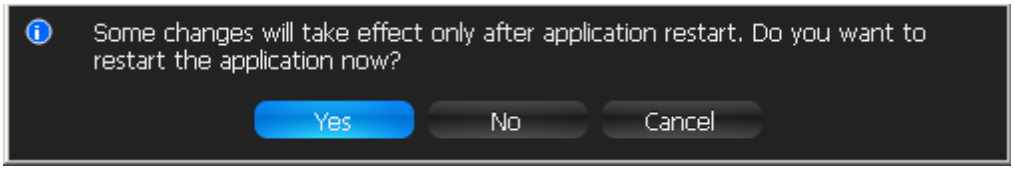
Qulu provides a number of ways to customize user interface. To start, open Main Menu and explore *Look and Feel* options (located in *System Settings* tab):



The following settings can be changed:

- *Tour sequence cycle time* – time between cycling items in Tour Mode (see "Tours")
- *Show IP in tree* – display IP camera and recorder addresses in Resource Tree
- *Timeline mode* – display time when viewing recorded footage (server time or local time)
- *Skin* – desired interface color scheme (*Dark* or *Light*)
- *Language* – interface localization.

Click *OK* when done or *Cancel* to discard changes. If the changes require restart, the corresponding warning will be displayed. Once the changes are applied, the software will suggest to restart automatically:



All changes will apply after restart.

Qulu Quick Start

This section provides recommendations on system settings for Qulu to be configured properly.

First, a sufficient number of **Licenses** should be obtained and activated (see "Obtaining and Activating Qulu Licenses (Admin Only)").

Then, **Storages** on each **Media Server** should be configured (see "Configuring Media Server Storages (Admin Only)").

All **Cameras** should be properly set up (see "Camera Managemnent"). Same with **Recording Settings** (see "Setting up Recording Schedule (Admin Only)").

Once completed, it becomes possible to create multiple **Users**, configure **Layouts** for them and more.

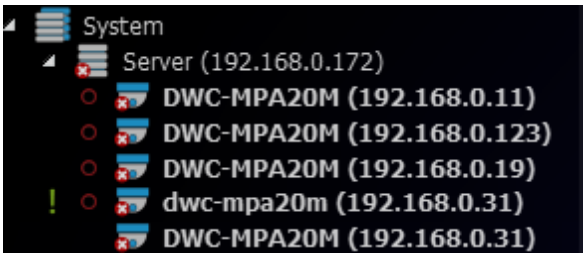
Obtaining and Activating Qulu Licenses

Qulu's license policy is quite simple. Each **Camera** requires **License**. The application has no camera count restrictions.

The **License** allows viewing and recording of a single **IP** or **Analog Camera**. **Cameras** can be viewed live without **Licenses** allowing for an unlimited number of **Cameras** to be connected and viewed live at no charge.

Note: If recording is enabled for **Camera**, **License** is considered **used** even if recording is not performed. Recording is required to capture Motion Detection and Input Detection events on **Camera**.

For instance, the following screenshot illustrates the situation that all **Cameras** are offline and not recording. However recording is enabled on four **Cameras** (marked by ○):



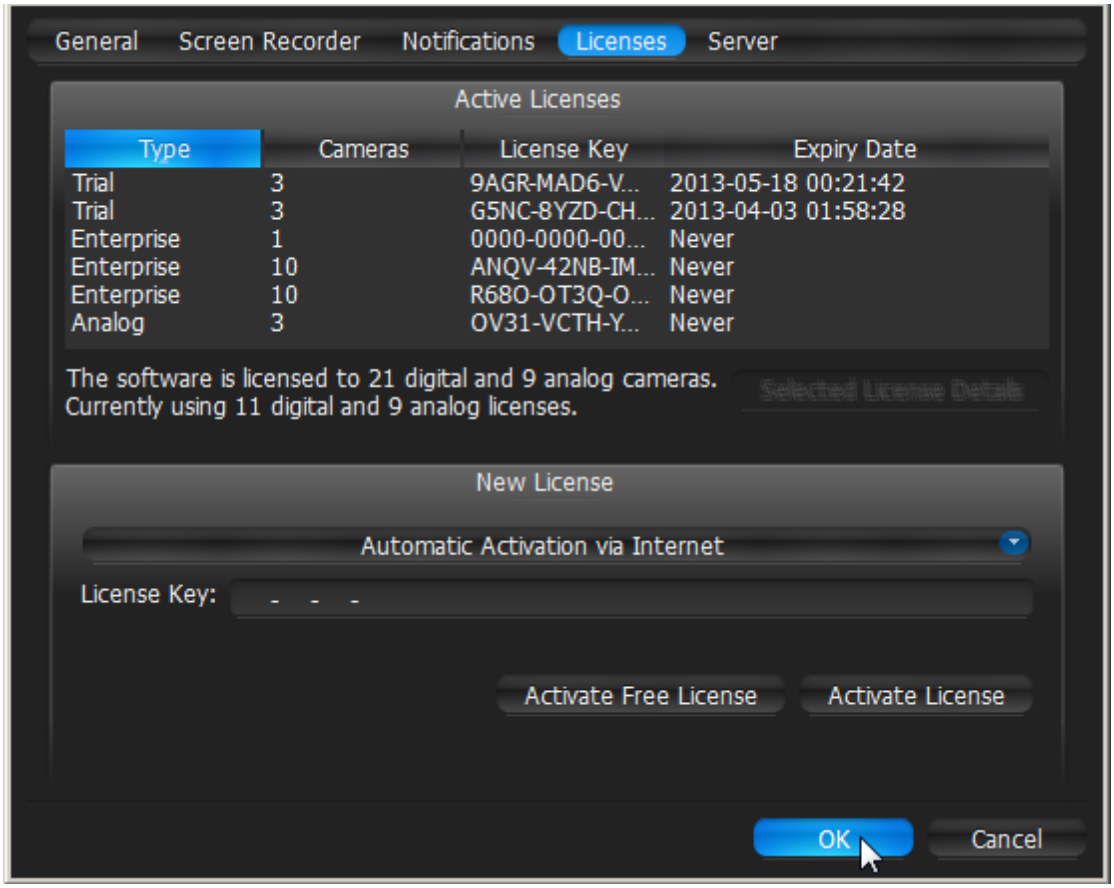
In this case 4 **Licenses** are being used.

See also "Setting up Recording Schedule".

Qulu comes with **four Trial Licenses** automatically. **Trial Licenses** are active only a certain amount of time.

To activate **Trial Licenses**:

1. Open Main Menu –> *System Settings*.
2. Go to *Licenses* tab.



3. Click *Activate Trial License*.

If **Trial License** is about to expire, the corresponding warning will appear.

To get additional **Licenses**, contact the local Qulu reseller (or Vista CCTV customer service at http://www.vista-cctv.com).

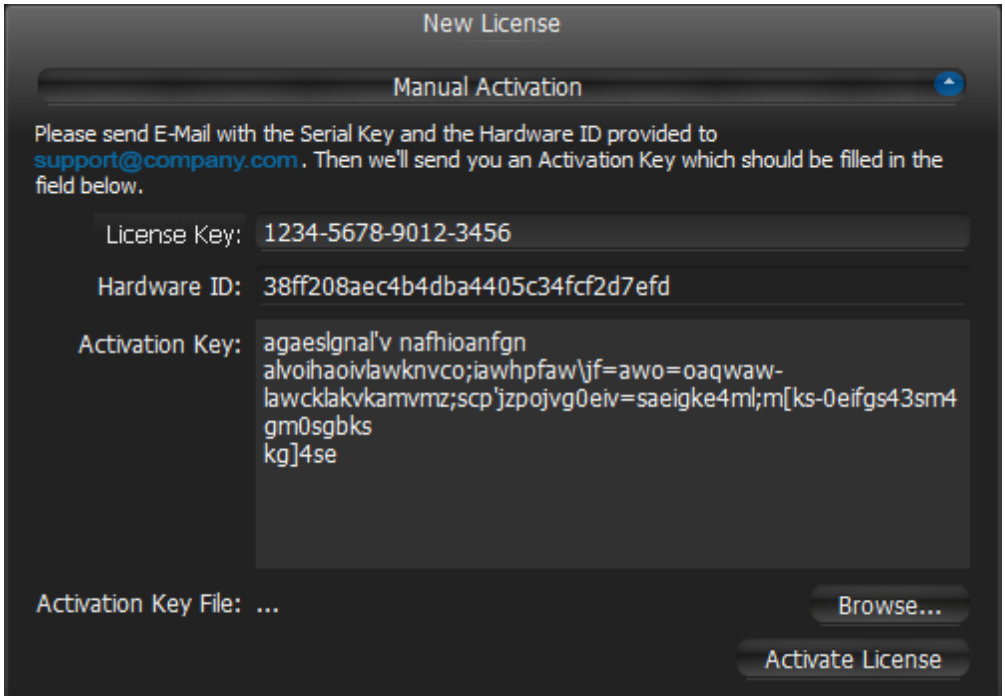
To activate **License Key** over the Internet:

1. Select the *Licenses* tab in *System Settings*.
2. *Automatic activation via Internet* must be selected.
3. Enter *License Key* and click *Activate License*.

If Qulu is not connected to the Internet, then licenses can be activated offline.

To activate License (trial or commercial) offline:

1. Go to *Licenses* tab in *System Settings*.
2. Click *Manual Activation*.


New License
Manual Activation
Please send E-Mail with the Serial Key and the Hardware ID provided to support@company.com. Then we'll send you an Activation Key which should be filled in the field below.
License Key:
1234-5678-9012-3456
Hardware ID:
38ff208aec4b4dba4405c34fcf2d7efd
Activation Key:
agaeslgnal'v nafhioanfgn alvoihaoivlawknvco;iawhpfaw\jf=awo=oaqwaw-lawcklakvkamvmz;scp'jzpojvg0eiv=saeigke4ml;m[ks-0eifgs43sm4gm0sgbks kg]4se
Activation Key File: ...
Browse...
Activate License

3. Copy Hardware ID and email to http://www.vista-cctv.com
   - *License Key*: paste **License key** received from reseller.
   - *Hardware ID*: paste **Hardware ID** here.

   An activation key will be provided upon request.
4. As soon as the activation key is received, proceed with one of the following:
   - Paste it into the *Activation Key* field and click *Activate License*.
   - Save it as a text file (i.e. **`key.txt`**), move to the target computer, browse the file and click *OK*.

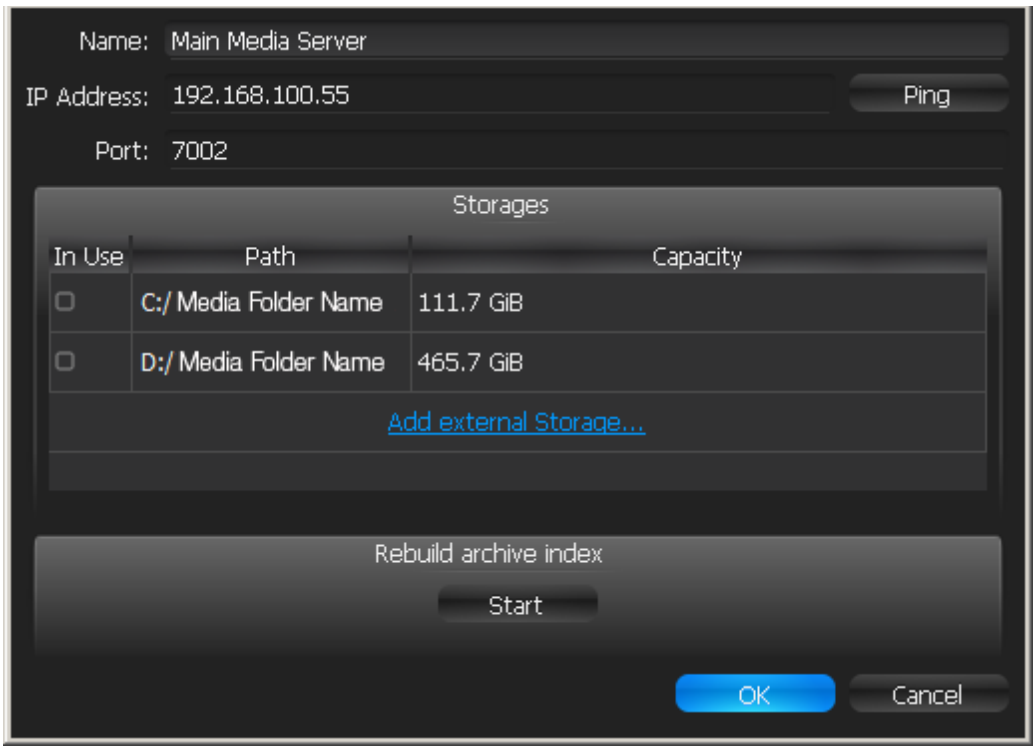
Obtaining and Configuring Media Server's Additional Settings (Admin Only)

In addition to the basic **Media Server** configuration that are setup during installation and configuration, an Admin also performs the following:

- Checking if Media Server is online (*Ping*). If Media Server is not responding for some reason this can help to check availability of the computer Media Server is hosted on
- Change Name
- Configure Storages.

To configure **Media Server** parameters:

1. Open the desired **Media Server** in Resource Tree.
2. Open server's Context Menu and choose *Server Settings*.



The following Media Server parameters can be checked and configured:

- *Name* – can be changed here or in Resource Tree
- *IP Address* – cannot be changed. Displayed in Resource Tree as well if the corresponding setting is enabled (see "Working with Resource Tree and Renaming Resources")
- *Port* – cannot be changed from the client
- *Ping* – check availability of the computer Media Server is hosted on
- *Storages* – see "Configuring Media Server Storages (Admin Only)"
- *Rebuild Archive Index* – restore recorded footage if moved. See "Restoring Broken Archive".

Configuring Media Server Storages (Admin Only)

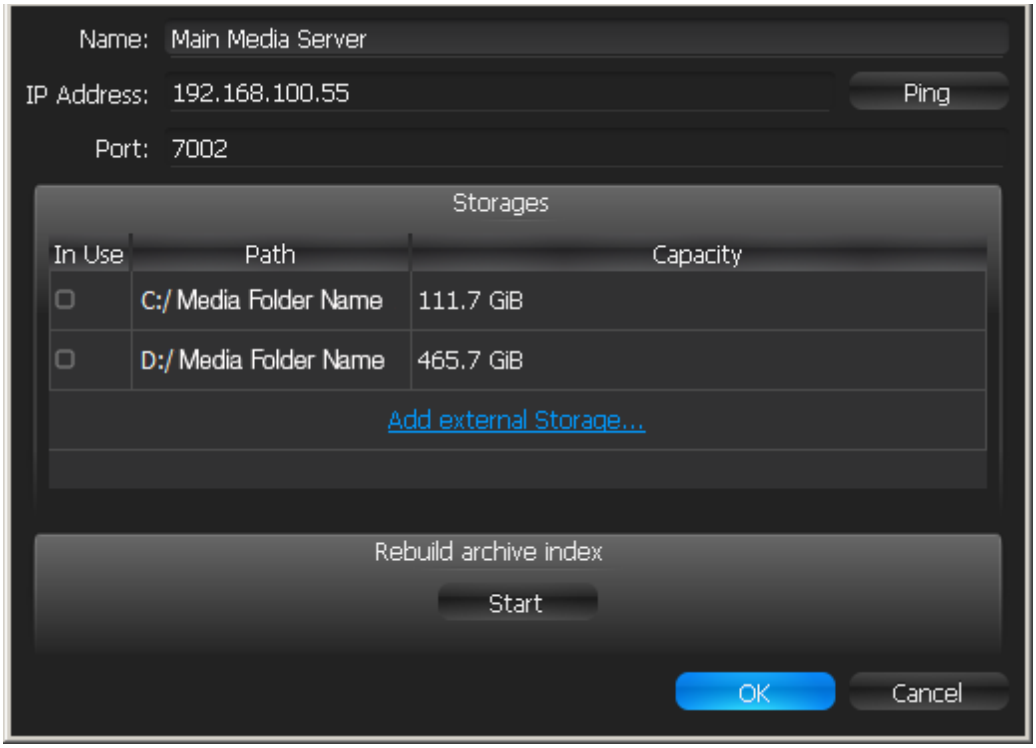
Qulu provides an easy and flexible storage management policy. Each **Media Server** can use unlimited number of local and network **Storages**. If more than one **Storage** is used, **Media Server** will automatically balance the space consumption. The more free space the storage has, the higher the usage intensity will be.

Storage is considered to be a separate hard disk partition. If a partition has more than **100 Gb** of free space, Qulu uses it automatically.

Additionally it is possible to add network storages.

To configure **Media Server Storages**:

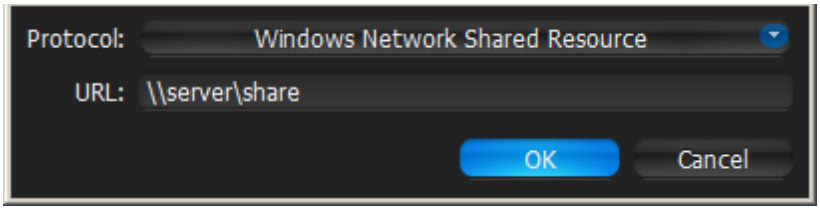
1. Open the Server Settings.
2. Go to *Storages*:



As displayed above, the computer has 2 partitions and only disk D is used for storage because disk C has less than 100 Gb of free space.

3. To select Storage to be used check *In Use* flag

4. To add **External Storage**, click *Add* and enter the storage Samba path:



IMPORTANT. If using **Network Storage**, the computer Media Server is installed on must have non-password read-write access to the Samba share. The most convenient way is to mount it as local disk (via **Samba**).

5. Click *OK*. At this point, all **Storages** will be checked for validity and ability to write to. If the drive has insufficient space, a warning will appear.

The **Storage** structure on the partition is as follows: **`<drive>/Qulu Media/$Resolution/$MAC/$YYYY/$MM/$DD/$HH`**:

- **`$Resolution`**:
  - **`hi_quality`** – full resolution streams
  - **`lo_quality`** – low resolution streams
- **`$MAC`** – MAC address of the recorded device
- **`$YYYY`** – Recorded Year
- **`$MM`** – Recorded Month
- **`$DD`** – Day
- **`$HH`** – Hour

IMPORTANT. 5 GB of free space is always preserved on **Storage**.

Deleting Media Server (Admin Only)

In some instances, it may be necessary to delete **Media Server** from the system.

Note: **Media Server** can only be deleted when **offline**.

To delete **Media Server**, locate it in Resource Tree, **Right-Click** for Context Menu and select *Delete*.

IMPORTANT. All cameras that are hosted on this specific server will be deleted as well. Recorded data will be kept in server's storages.

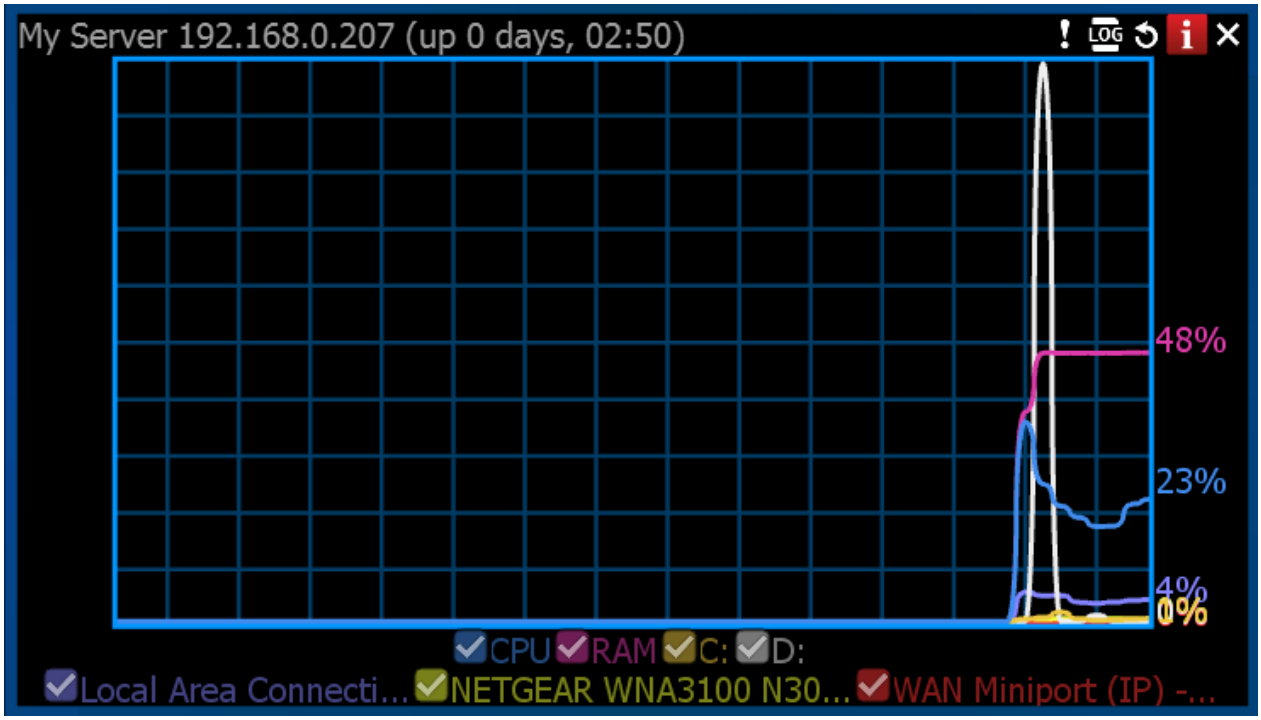
Media Server will automatically be registered in **EC**, discover all **Cameras** and start operating once it is back online. The deleted camera's archive will remain available. It will be required to perform all storage settings and configure all discovered **Cameras** again.

Monitoring Media Servers (Admin Only)

Qulu enables users to perform monitoring the health of **Media Servers** in the real-time mode. To proceed, perform one of the following:

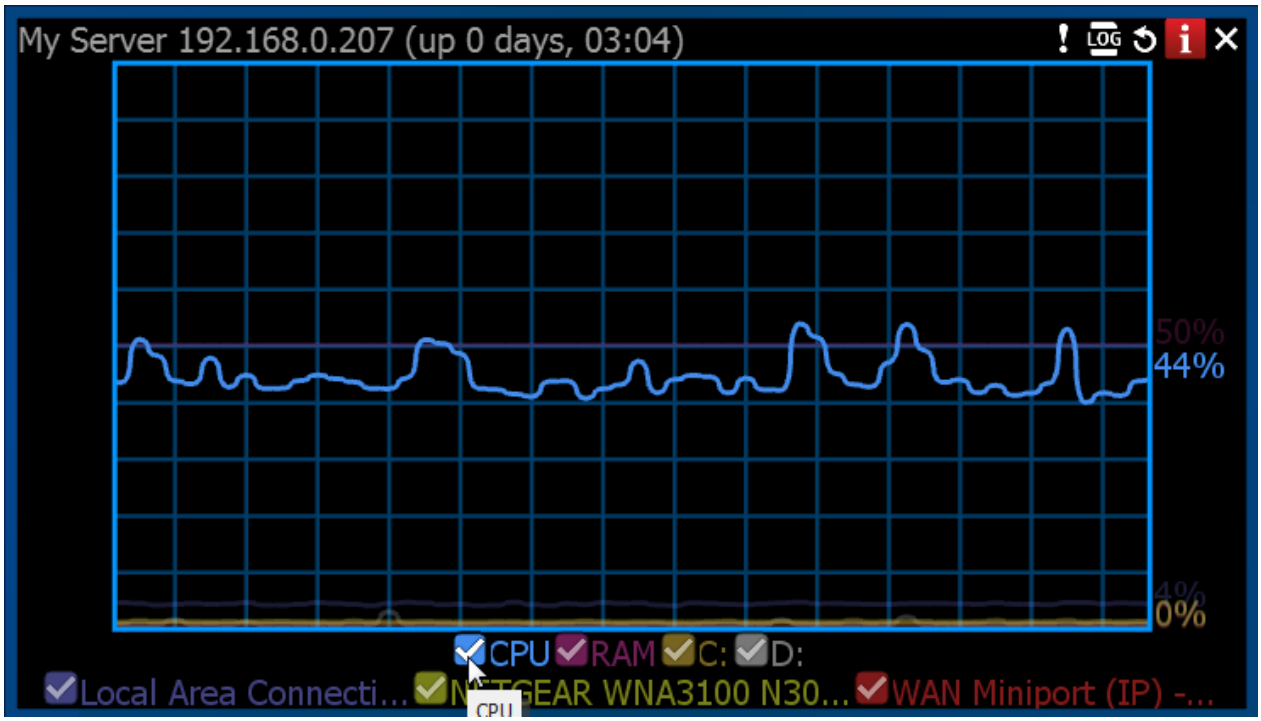
- Drag **Media Server** from Resource Tree to **Scene**
- Open Media Server's Context Menu and choose *Monitor* (*Monitor in a New Tab* or *Window*).

The information is displayed as follows:



- Uptime (the time since the server is started)
- CPU Load
- Memory Usage (*RAM*)
- Hard disk partitions usage (*C:* and *D:* in this case)
- Network Interfaces Usage

To enable/disable graphs check/uncheck them. If hover with a mouse cursoe on a check, the corresponding graph will be clearly visible, the rest-ones will be faded:



User can perform standard manipulations with **Monitoring Item**: move, resize, swap, duplicate etc (see "Items on Layouts").

To stop monitoring, remove the corresponding item from **Scene**.

Multiple **Media Servers** can be monitored simultaneously.

Cameras and Encoders Management

It is extremely easy to configure **Cameras** in Qulu.

The following **Camera Settings** are crucial for the application to function properly:

- **Recording schedule** (see "Setting up Recording Schedule")
- **Authentication** (the default password has been changed for cameras). See "Configuring Camera Authentication ".

IMPORTANT. Most camera parameters can only be configured by **Advanced Viewer** (permission level is required). A basic viewer can access camera configuration, but cannot make any changes. See the "User Management" section for more.
The section describes the following functions related to **Cameras**:

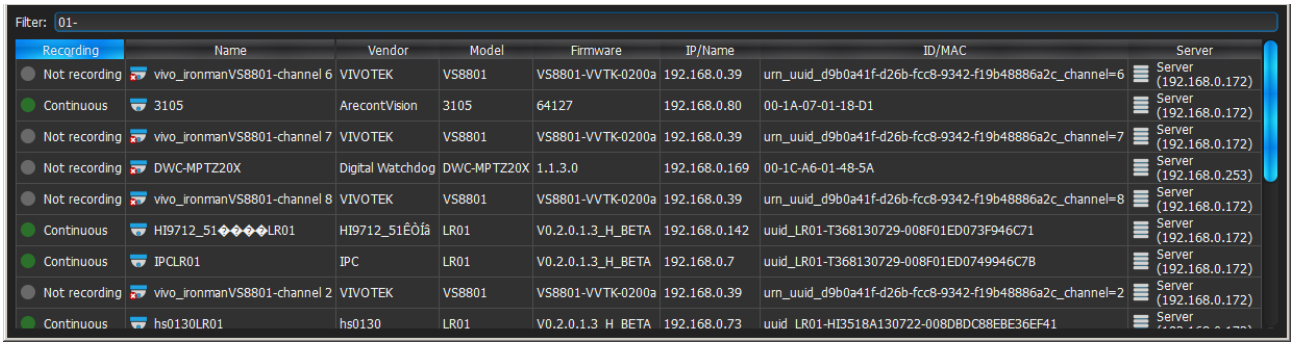
- Viewing Full Camera List
- Adding Cameras and Encoders
- Setting Up Cameras
- Setting Same Parameters for Multiple Cameras
- Swapping Cameras between Media Servers (Admin Only)
- Deleting Cameras (Admin Only)

Viewing Full Camera List

All **Cameras** registered in Qulu are displayed in Resource Tree. If may be problematic to find a particular camera when too many **Cameras** appear in **Tree**. It is possible to use Search to locate **Cameras** on **Scene**.

To use a more organized list, open Main Menu and select *Camera List...* (or press ***CTRL + M***).

The information is broken down by the following columns:



- *Recording* – recording of **Camera** (*Not recording*, *Continuous*, *Motion only*, *Motion + Lo-Res*). See "Setting up Recording Schedule".

  Note: this is not an indication on how **Camera** is being recorded.

- *Name* – **Camera** name.
- *Driver* – **Camera's** manufacturer/maker. When interacting with a 3rd party Cameras via Onvif protocol, *OnvifDevice* is displayed.
- *Model* of **Camera**.
- *Firmware* – the current firmware version.
- *IP/Name* – **Camera's** IP address.
- *ID/MAC* – **Camera's** MAC address. It is not possible at times to determine the MAC address. In this instance, a unique identifier is shown (i.e. **`urn_uuid_207f19b2-d5a6-407f-8fec-6265a311058b)`**
- *Server* – the Media Server **Camera** is hosted on.

The following tools are available to manage **Camera List**:

- **Sort data** by column. **Left Click** on column's header.
- **Filter data**. Type the filter sub-string into the *Search String* field (on the top). The results will be refresh as typing. To disable filtering, clear the sub-string.
- **Select several rows** from the table. Drag the mouse, use ***CTRL + Click/Up/Down*** arrows, or ***Shift + Click/ Up/Down*** arrows. Use ***CTRL + A*** to select all **Cameras**.
- **Open one or several Cameras**. Select the desired **Cameras**, open Context Menu and choose *Open*, *Open in New Tab*, *Open in New Window*.
- **Rename Cameras**. Select **Camera**, open Context Menu and choose *Rename*.
- Viewing **Camera's event history**. Select **Camera**, open Context Menu and choose *Check Camera Issues...* Event History form will open and filtering against the selected **Camera** will apply.
- **Delete** one or multiple **Cameras**. Select the desired **Cameras**, open Context Menu and choose *Delete*.
- Go to Cameras Settings. Select the desired **Cameras**, open Context Menu and choose *Camera Settings...*
- **Export** data from one or multiple **Cameras** to an external file. Select the desired **Cameras**, open Context Menu and choose *Export Selected to File...* Select file name and format. The following formats are supported:
  - HTML File
  - CSV file (text file with delimiters). This file type can easily be imported into Microsoft Excel.
- Copy one or several rows to clipboard. Select the desired rows, open Context Menu and choose *Copy Selection to Clipboard*. The data can be pasted into any text editor or Microsoft Excel.

Adding Cameras and Encoders

This section provides information on how to add cameras to the Qulu resource list.

Choose one of the following methods:

- Discovering Cameras Automatically
- Disabling Automatic Discovery (Admin Only)
- Adding Cameras and Encoders Manually (Admin Only)
- Adding RTSP or HTTP Streams as Cameras (Admin Only).

Discovering Cameras Automatically

Qulu provides a powerful and easy-to-use mechanism for automatic camera discovery. It is required that a camera should be accessible via **Broadcast.**

As soon as **Media Server** is started and connected to **EC**, it automatically performs camera discovery in its network. Once a camera is discovered, its parameters will be displayed in Resource Tree automatically.

If a camera does not transmit media data, it is marked as **Offline**.

If **Media Server** is offline, all **Cameras** the server is hosting are switched to the offline status **automatically**.

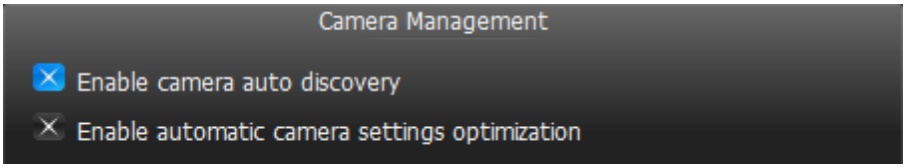
Once **Camera** is discovered, <%PRODUCT NAME%> tries to configure the following settings on **Camera**: the best possible image settings for the main video stream (best possible resolution and FPS) and optimal ones for the secondary stream (240p to 320p, 2 to 7 FPS). To disable this feature, see "Preventing Qulu from Changing Camera Streaming Settings".

If **Camera** was deleted (see "Deleting Cameras (Admin Only)") and connected again, it will be re-discovered. Disable this feature to avoid auto camera discovery. See "Disabling Automatic Discovery (Admin Only)".

Disabling Automatic Discovery (Admin Only)

Once **Camera** is discovered, the only way to delete it is to unplug it from the network (see "Deleting Cameras (Admin Only)"). However, if **Camera is** plugged back again, it will be re-discovered. To avoid this it is possible to disable this feature:

1. Open Main Menu and go to *System Settings –> Server*.
2. Uncheck *Enable camera auto discovery* in the *Camera Management* section.



3. When finished, press *OK* to apply or *Cancel* to discard settings.

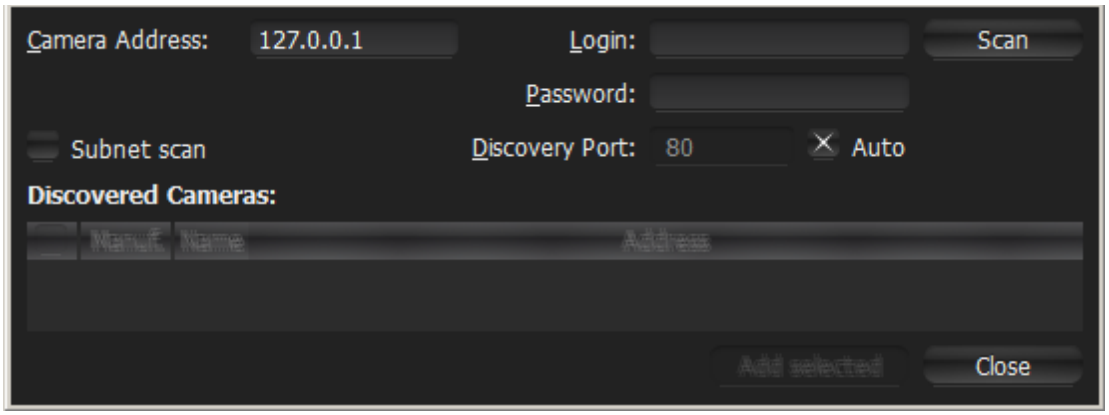
IMPORTANT. Once the feature is disabled, new cameras will no longer be auto-discovered, only added manually.

Adding Cameras and Encoders Manually (Admin Only)

If **Camera** or **Encoder** is not accessible via broadcast (usually if it is located in a different network), it will not be discovered automatically. In this case Qulu provides an ability to add **Camera** manually. For instance, it can be useful if **Camera** or **Encoder** is located in a different network or can even be accessed via Internet only. It is also possible to add several **Cameras** simultaneously by scanning a range of IP addresses.

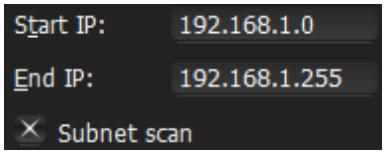
To add one or more **Cameras/Encoders**:

1. **Right-Click** on server in Resource Tree and open Context Menu.
2. Choose *Add Camera(s)...* The following view will appear:



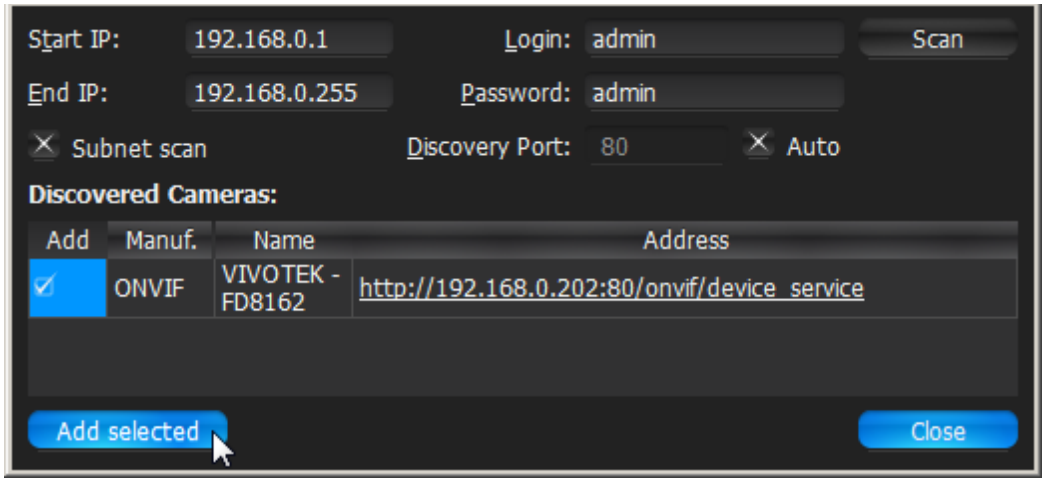
3. Choose one of the following:
   - To add a single **Camera**, enter camera's *Address* (**IP** or **Host Name** the **Camera** can be resolved on)

   IMPORTANT.Qulu allows adding **Cameras** by **IP Address**, **Host Name** or **Generic RTSP/HTTP Link** (advanced). See "Adding RTSP or HTTP Streams as Cameras (Admin Only)".
   - To add several **Cameras** at once, select *Subnet Scan*:

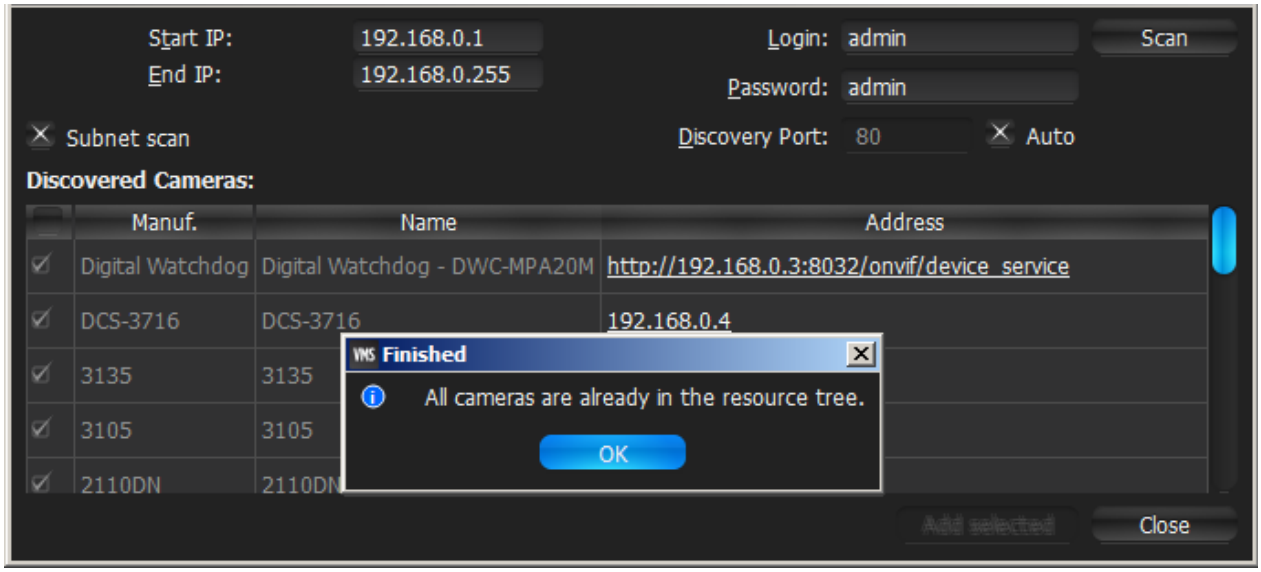


4. Enter the desired IP range to start scanning. By default, addresses `0-255` of the same subnet are suggested. As a result, the entire specified network will get scanned for **Cameras**.
6. Specify authentication parameters in *Login* and *Password* fields (if needed).
7. Specify *Discovery Port* if needed. Most **Cameras** are discovered on port `80`, so it is better to leave on *Auto* setting.
8. Press *Scan* to initiate search. This can take a lengthy period of time (especially if IP Range is being scanned).

9. If **Cameras** are located, they will be displayed in order.



If **Camera** is already registered (manually or automatically), it will be displayed though cannot be selected for addition:



10. Select desired cameras and click *Add selected*.

Cameras should be added to Resource Tree.

Adding RTSP or HTTP Streams as Cameras (Admin Only)

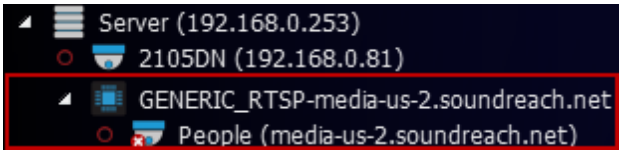
Some camera models are not fully compatible with **Onvif Profile S**; therefor, will not work properly in Qulu. However, if such **Cameras** can provide streams by **RTSP** or **HTTP**, they can still be viewed and recorded.

Note: to add, it is important to check if a particular camera model supports this option plus know the exact **RTSP/HTTP URL** of the stream. This information can be found in camera's guide or by contacting the manufacturer.

To add the stream use the standard manual addition procedure (see "Adding Cameras and Encoders Manually (Admin Only)").

First, Make sure *Subnet Scan* is unchecked, then enter **RTSP** or **HTTP URL** (i.e. **`rtsp://<camera IP>:554/hi_stream`**) instead of **Camera IP**.

Once added, **Camera** will be displayed in Resource Tree as follows way:



It can now be configured as any regular **IP Camera** (see "Setting Up Cameras").

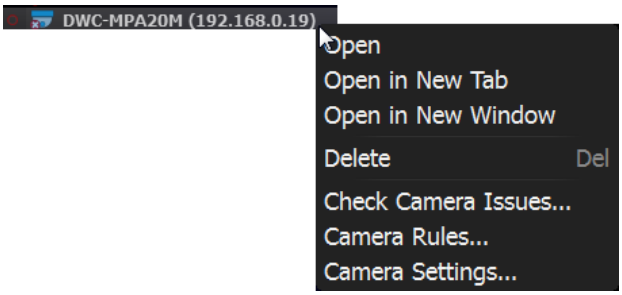
Note: only one stream can be added per **Camera**, so **Dual-Streaming** benefits will not be available (see "Dual Stream Recording Specifics (RADASS)"). Lastly, if resolution is greater than 720*576, software motion detection will not be available.

Setting Up Cameras

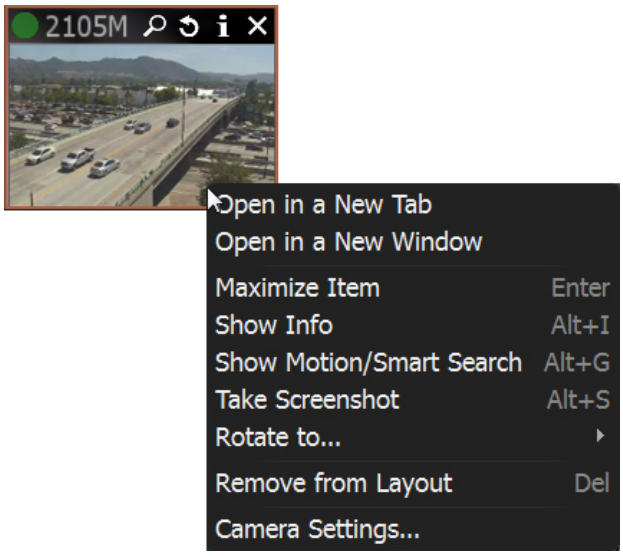
It is possible to configure **Cameras** for **Administrators** and **Viewers** that have the appropriate access **Permission**. **Administrators** can configure all cameras and **Viewers** can only use the ones that are assigned to them by **Administrators**.

A user can locate *Camera Settings* from **Camera**'s Context Menu.

From Resource Tree:



From **Scene**:

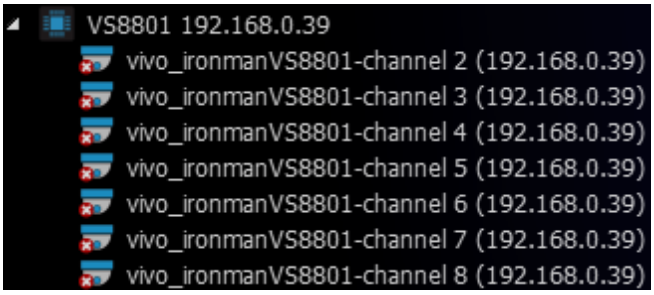


The following actions can be performed when configuring **Camera Parameters**:

- Renaming Cameras
- Obtaining Camera's IP, MAC , Firmware and Model
- Configuring Audio on Camera
- Configuring Camera's Authentication
- Forcing Aspect Ratio for Cameras
- Setting up PTZ on PTZ and Fish-Eye Cameras
- Setting Up Fish-Eye Cameras
- Setting up Recording Schedule
- Setting up Motion Mask and Motion Sensitivity
- Configuring Proprietary Camera Parameters
- Adjusting Secondary Stream Quality
- Forcing Aspect Ratio for Cameras.

Setting up Analog Cameras

Typically, Analog Cameras are connected to via **Analog Recorders**. Each **Recorder** has a number of channels that indicates the number of **Analog Cameras** it can handle. If **Recorder** is plugged into the network, it can either be discovered automatically or added manually (see "Adding Cameras and Encoders"). **Encoder** with discovered channels looks as the following:



The following types of **Analog Cameras** are supported:

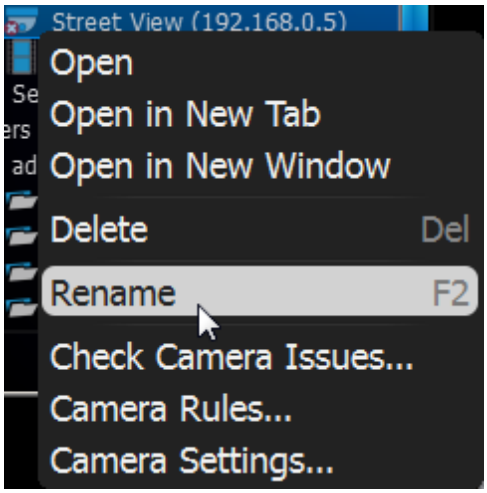
- **Analog Cameras** plugged into **Encoder**. Those cameras act like regular Cameras: it is possible to configure Recording Schedule for them as well as Motion Detection.
- **Analog Cameras** plugged into **Recorder**. Those cameras are recorded somewhere else so Qulu only pulls the desired stream from the recorder. It is not possible to configure Recording Scheduleand Motion Detection for those **Cameras**.

Renaming Cameras (Admin Only)

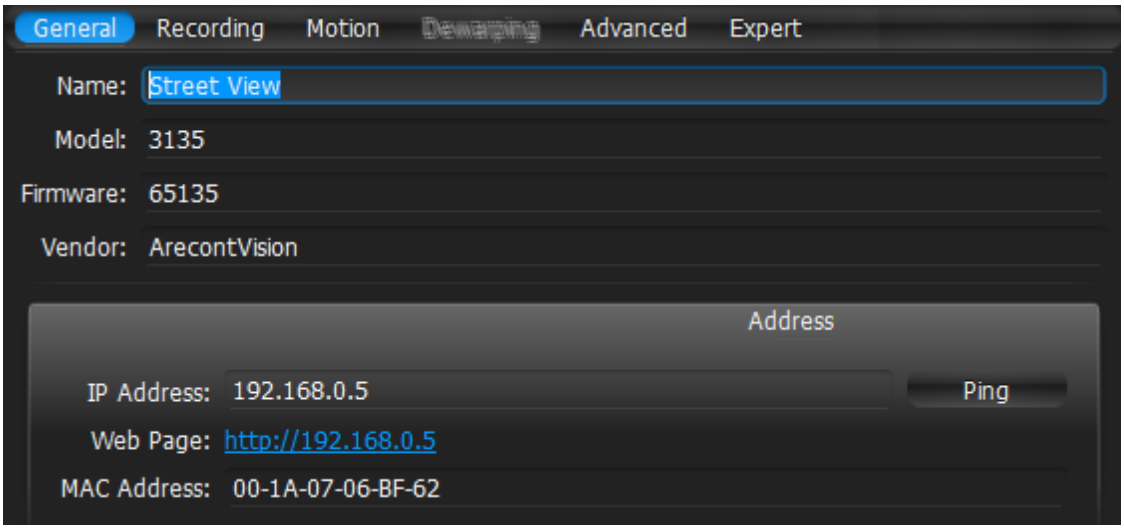
If a camera is discovered automatically (see "Discovering Cameras Automatically"), it is displayed in Resource Tree as a predefined sequence ("model"or "manufacturer + model"). For instance, `10005` for Arecont Vision cameras or `DWC-MD421D` for Digital Watchdog.

Note: It is possible to configure **Cameras** for **Administrators** and **Viewers** with an appropriate **permission** level.

It is recommended to rename same camera models for easier identification. Cameras can be renamed directly from Resource Tree using Context Menu (or ***F2***):



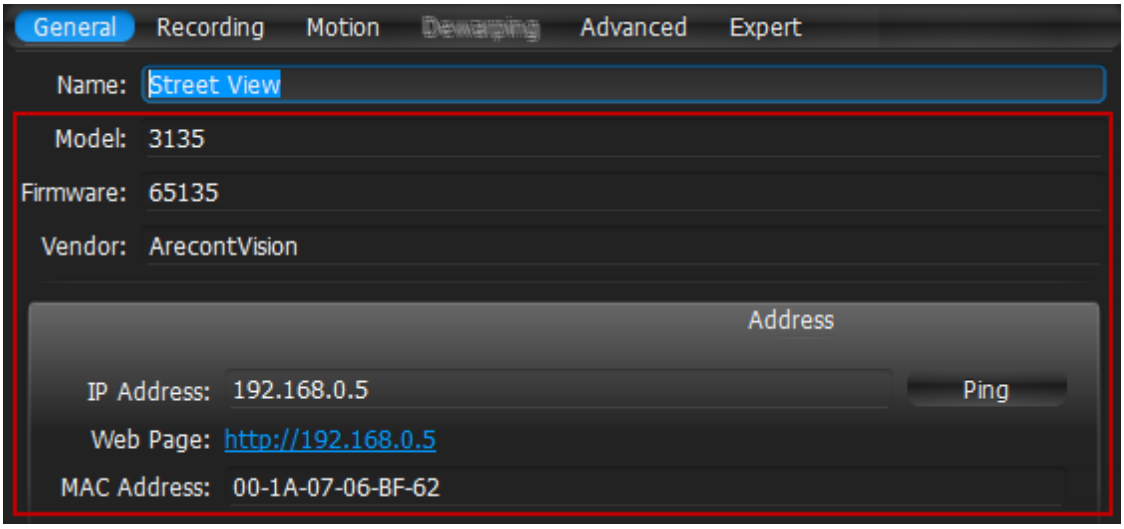
or in camera settings:



IP-addresses are added to a camera name automatically and are **non-editable**. It is possible to deactivate displaying IP addresses in Resource Tree.

Obtaining Camera's IP, MAC, Firmware and Model

To obtain **Camera**'s IP and MAC, open camera settings and go to *General*:



The fields are non-editable.

Note: this information is available for **Administrators** and **Viewers** with an appropriate **permission** level.

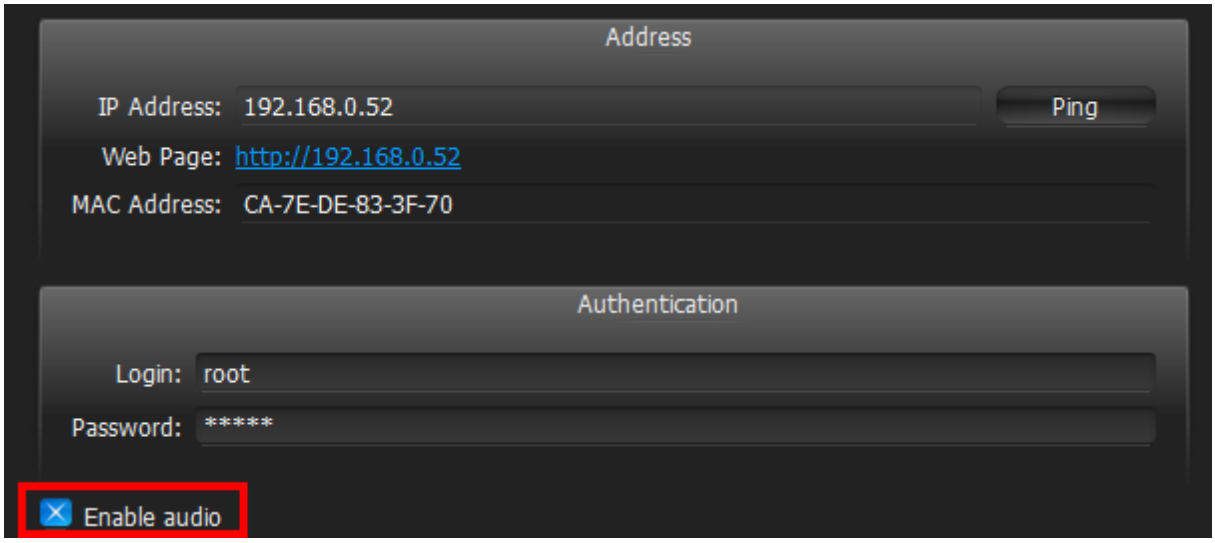
It may be useful to go to **Camera**'s web page by clicking on the appropriate hyperlink to check or set up **Camera**'s parameters. See "Configuring Proprietary Camera Parameters" for details.

It is possible to check if a camera is accessible by pressing the *Ping* button.

Configuring Audio on Camera

Qulu allows to record audio from Cameras (if camera has this feature and the microphone is connected to it).

To set up audio recording for the camera open camera settings and go to *General*:



To enable/disable audio enable or disable the corresponding flag. The settings are applied right after *Apply* or *OK* are clicked.

It may be useful to go to **Camera**'s web page by clicking on the hyperlink. See "Configuring Proprietary Camera Parameters" for details.

IMPORTANT. It is possible to configure audio for multiple cameras at a time. See "Setting Same Parameters for Multiple Cameras".

Configuring Camera's Authentication

All **Cameras** come with a predefined login and password combination. During the discovery process, Qulu attempts to use manufacturer's default credentials to access a camera.

However, default login and passwords may vary between models/lines or can be changed deliberately, which prevents Qulu from accessing **Cameras** and acquiring media streams. As a result, **Camera** is shown as **Unauthorized** ( ) in Resource Tree. The following message will appear if a user attempts to view a live stream:

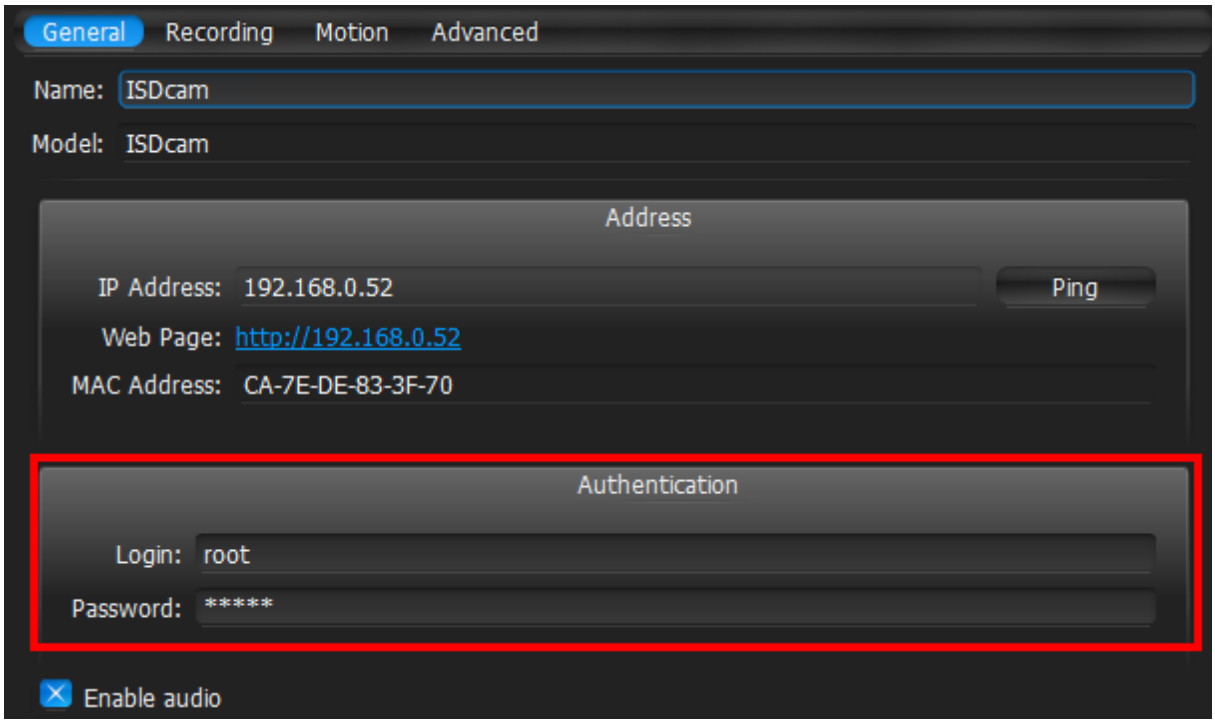
UNAUTHORIZED

Please check authentication information in camera settings.

Note: It is possible to configure **Cameras** for **Administrators** and **Viewers** that have the appropriate **permission** level.

To get **Camera** working it is necessary to setup **Authorization Parameters**:

1. Open Camera Settings and go to *Network*.
2. Enter *Login* and *Password* in the *Authentication* section and click *Apply* or *OK*. To discard changes, click *Cancel*.



IMPORTANT. It is possible to configure same authentication credentials for several cameras simultaneously. See "Setting Same Parameters for Multiple Cameras".

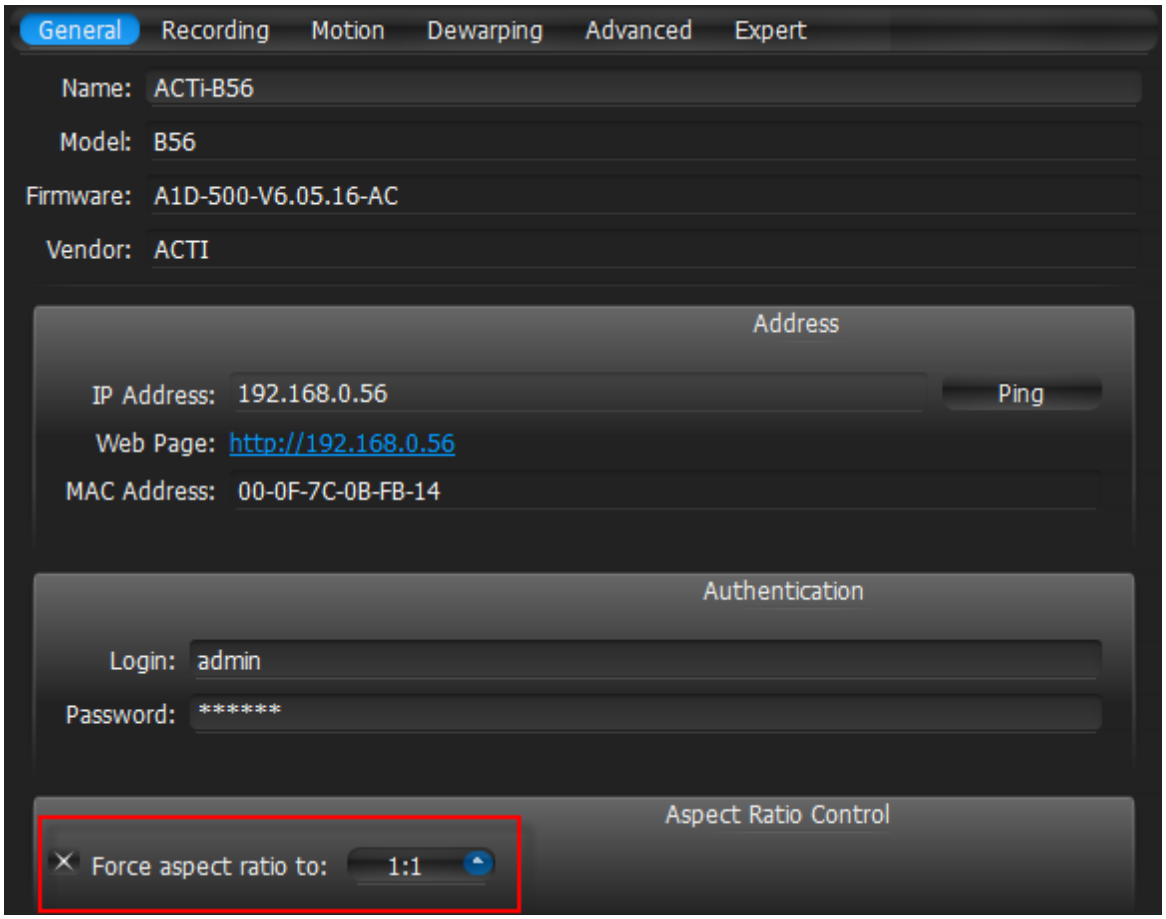
Forcing Aspect Ratio for Cameras

Occasionally, **Cameras** report an incorrect **Aspect Ratio.** In such instance, Qulu automatically corrects A**spect Ratio** for **Cameras**.

Note: this correction **will require transcoding** if exporting videos from **Camera**. See "Exporting Recorded Region from Single Camera".

To specify **Aspect Ratio**:

1. Open Camera Settings and go to *General*.
2. Enable *Force aspect ratio* flag and select the desired ratio. The following AR are available: *1:1*, *4:3*, *16:9*.



3. Disable the flag to restore the original **Aspect Ratio.**
4. The settings are applied once *Apply* or *OK* are clicked.

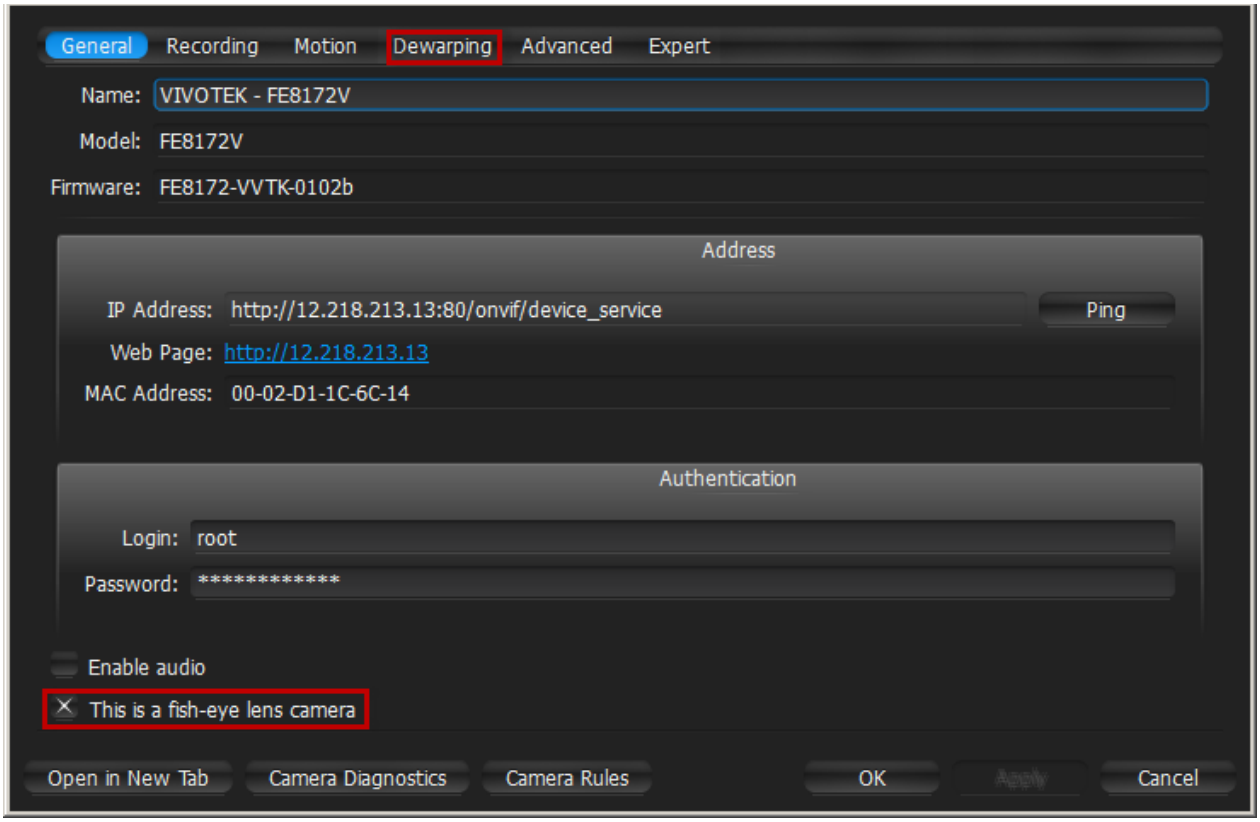
Setting Up Fish-Eye Cameras

Qulu provides advanced capabilities to operate with fish-eye cameras. Such cameras use a specific type of lens that can cover a much larger viewing area. This particular type of lens warps a picture and a de-warping algorithm must be enabled to display the picture correctly:

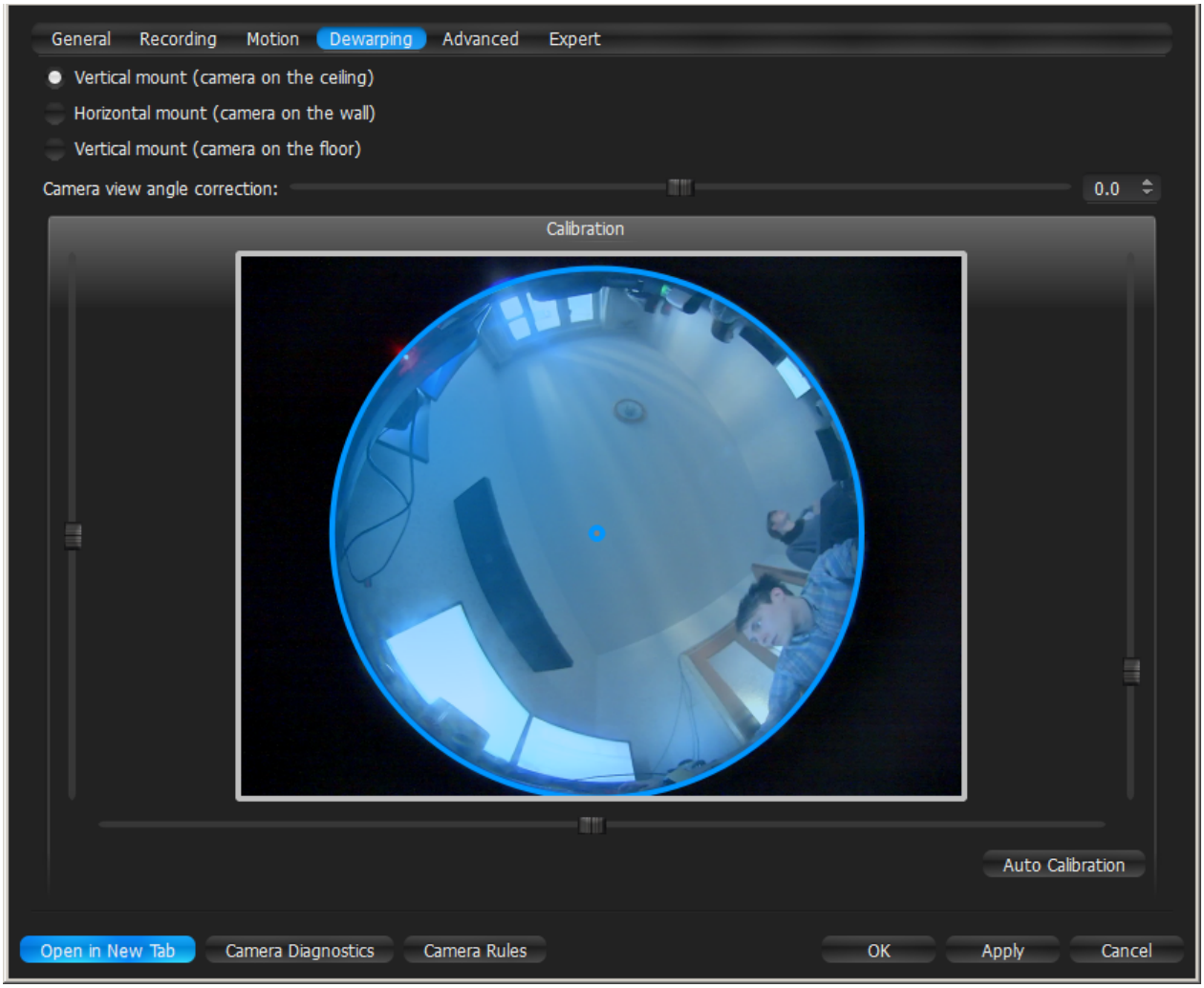
Note: It is possible to configure **Cameras** for **Administrators** and **Viewers** with an appropriate **permission** level.

In order for Qulu to distinguish cameras with fish-eye lens, the following configuration must be performed:

1. Open Camera Settings and go to *General*.
2. Check *This is a fish-eye lens camera* to activate the *Dewarping* tab:



3. Go to the *Dewarping* tab to select the following parameters:



- **Camera**'s orientation - type of de-warping algorithms based on orientation.
- **Calibration** - to avoid de-warping artifacts, it is important to position the calibration circle within the **Camera**'s view as accurately as possible. First, try *Auto Calibration,* then manually adjust the viewing range (if needed):
  - **Use scrollers to move the circle horizontally or vertically (or drag it with a mouse)**
  - **Use a mouse wheel to resize the circle**
- **Camera**'s view angle.

Note: It is recommended to keep **Camera** on **Scene** to monitor any image changes while adjusting settings.

4. Click *Apply* or *OK* when finished. To discard changes, click *Cancel*.

Once **Camera** is established as a fish-eye camera, de-warping can be performed. See "De-warping Fish-Eye Cameras" for details.

Setting up PTZ on PTZ and Fish-Eye Cameras

Qulu provides a smart and intuitive way for setting up **PTZ** on **Cameras**, in addition to easy controls for **PTZ** on **Fish-Eye Cameras** and **Screenshots** (see "De-warping Fish-Eye Cameras").

PTZ on **PTZ Cameras** can be set by either **Administrator** or **Viewer** (a corresponding permission level is required – see "User Management"). **PTZ** on **Fish-Eye Cameras/Screenshots** is accessible to all users.

This feature is available **for PTZ Cameras** if:

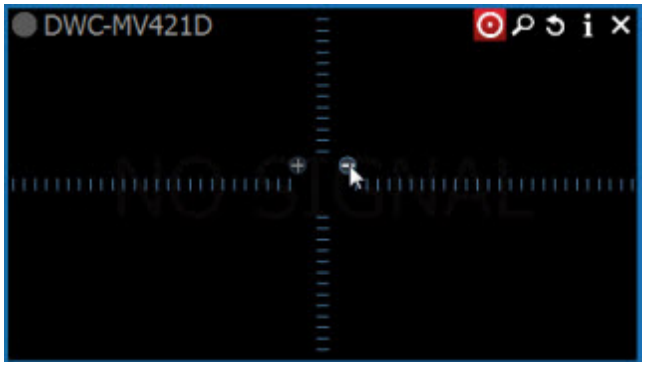
- It is supported by the **Camera** model (**Onvif Cameras only**)
- **Camera** is in **Live** mode

If the requirements are met, will display on the corresponding camera item.

These restrictions do not apply to **Fish-Eye Cameras** and **Screenshots**.

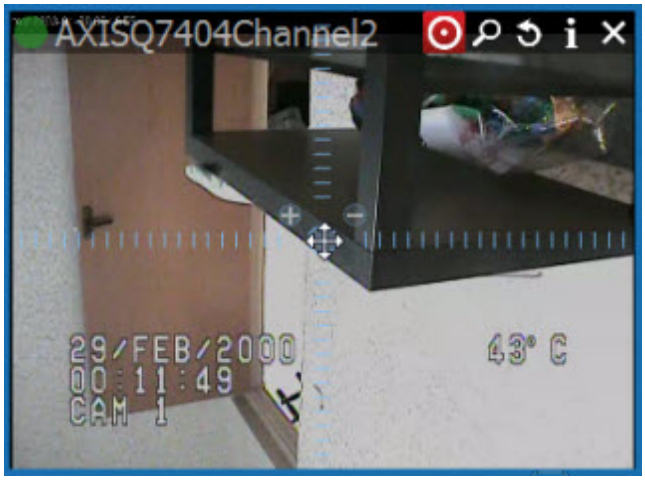
The following PTZ modes are available:

- **Simple** (**Zoom only**). Refer to the following image:



Use **+** and **-** buttons to zoom in/out.

- **Regular** (**Zoom** and **Point**). Refer to the following image:



Use **+** and **-** buttons to zoom in/out. **Left-Click** on the center circle, **Hold Left Mouse Button** and **move the cursor** to move **Camera** to the desired position.

Additionally, if Camera supports **Absolute Move**, the following features will be available:

- Save and restore PTZ positions
- Setting Up PTZ Tours
- Setting Up Home Positions or Tours (see "Home Positions and Tours for PTZ and Fish-Eye Cameras")

- **Extended** (**Zoom**, **Point and additional features**). Requires the support for **Absolute Move** from **Camera** and **custom integration**:

In this case **Camera** allows moving and zooming as in previous case, plus:

- Move to a certain position – **Left Click** to the desired position
- Zoom to a certain range – Hold **Left Mouse Button** and draw the rectangle to zoom into (see the above picture)
- Full Zoom Out – **Double Click**.

- **Fish-Eye Cameras/Screenshots** support full PTZ functionality.

After all settings are configured press once again to hide PTZ controls.

Saving and Restoring PTZ Positions

In addition to standard PTZ controls, Qulu allows for managing of predefined PTZ positions. It is basically possible to set up several points, tilt and zoom presets and restore them with only two clicks or one hot key.

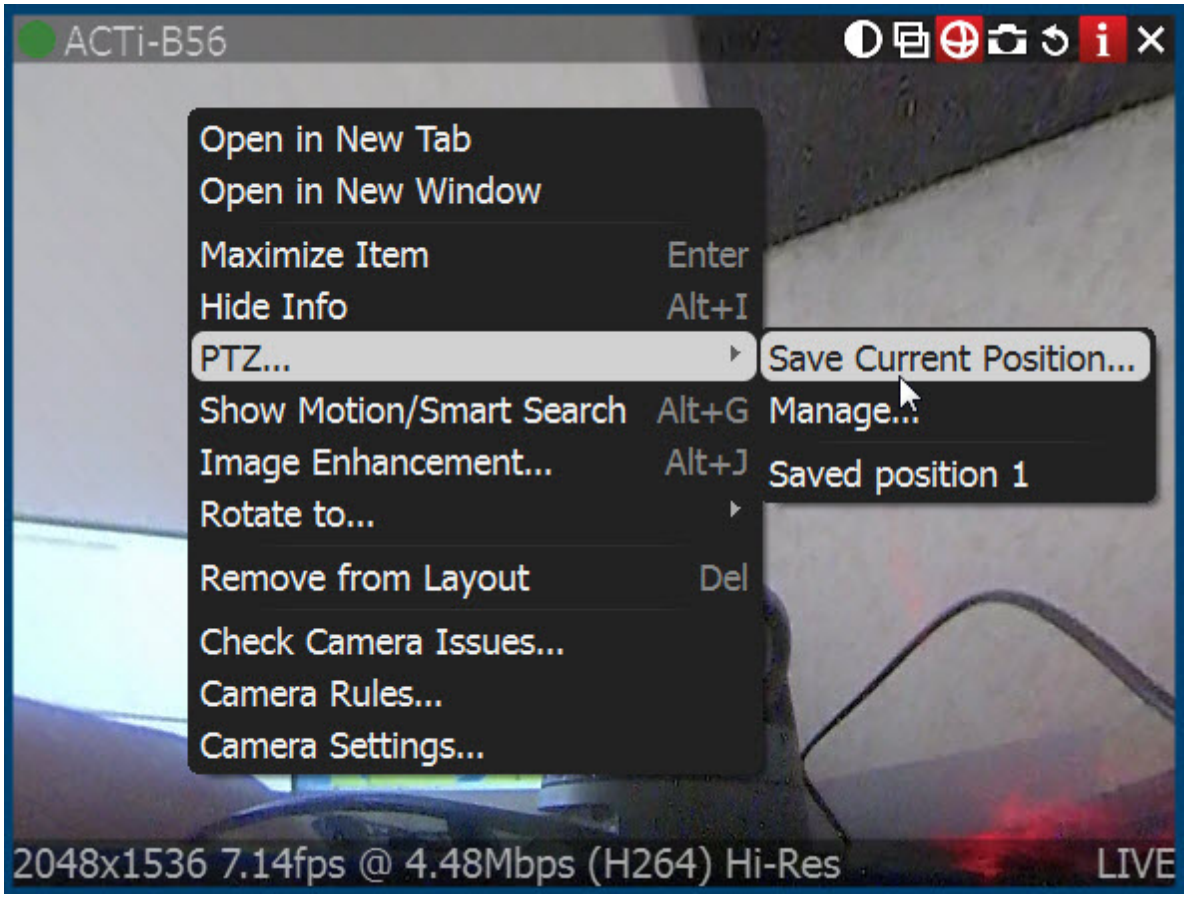
Then PTZ presets can be used for composing **PTZ Tours** (see "Setting Up PTZ Tours") or serve as a **Home Position** (see "Home Positions and Tours for PTZ and Fish-Eye Cameras").

Note: It is possible to configure PTZ on **Cameras** for **Administrators** and **Viewers** with the appropriate **permission** level.

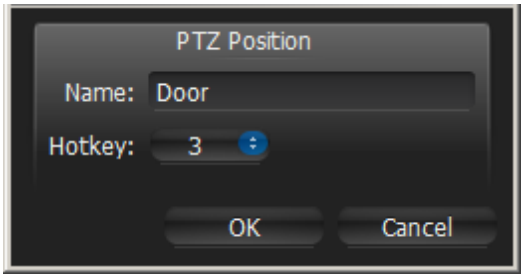
The following is possible:

Saving PTZ positions (simple):

1. Set up a desired **PTZ Position** on **Camera** using **PTZ Controls** (see "Setting up PTZ on PTZ and Fish-Eye Cameras")
2. Open Context Menu and select *PTZ... -> Save Current Position*...



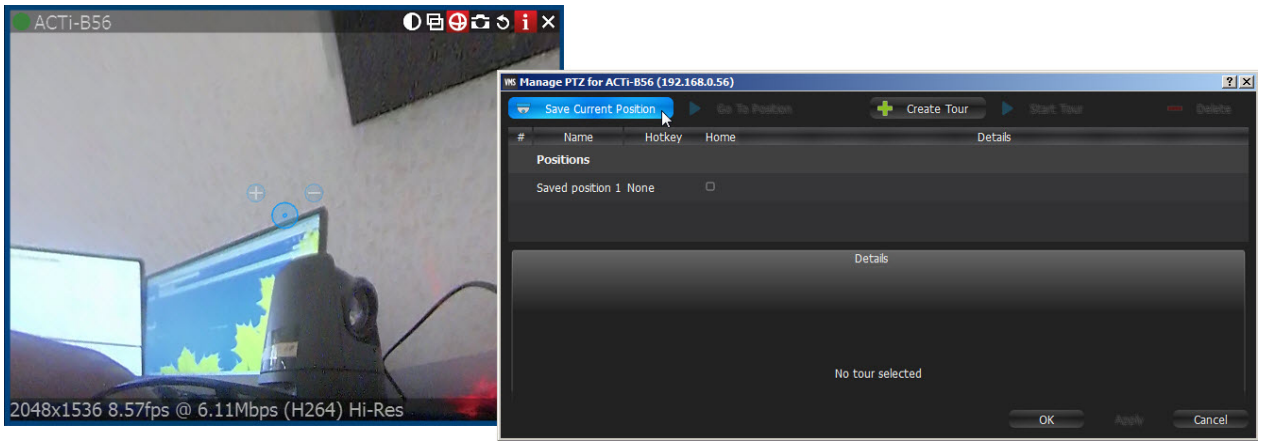
3. Type a desired preset name.



4. If needed, select a hot key for preset (***0-9***).

Saving and Editing PTZ positions (advanced):

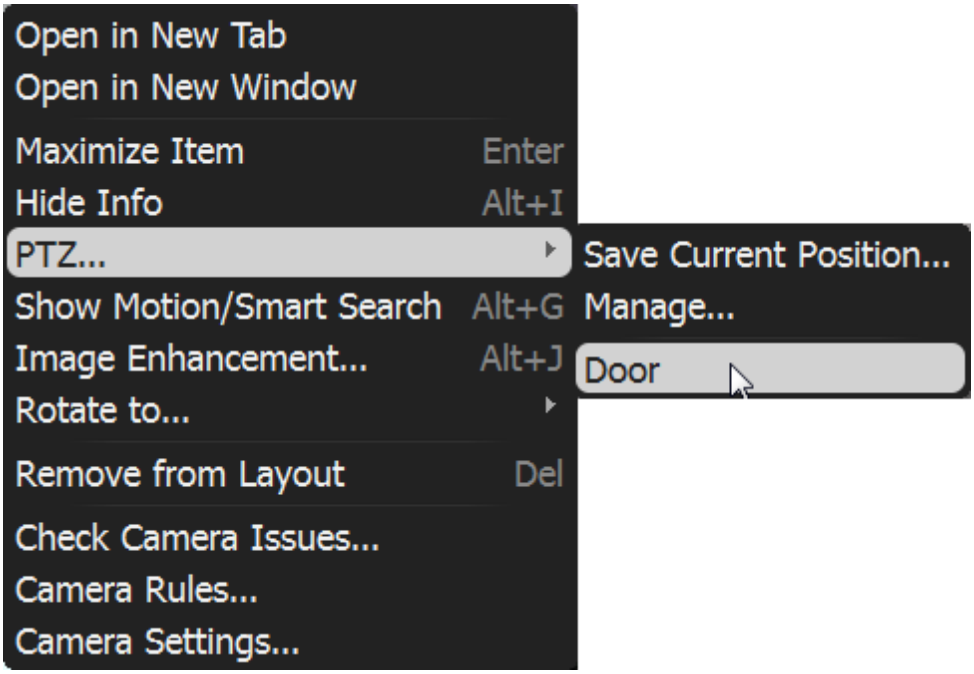
1. Open Context Menu and select *PTZ... -> Manage*. The following form will appear:



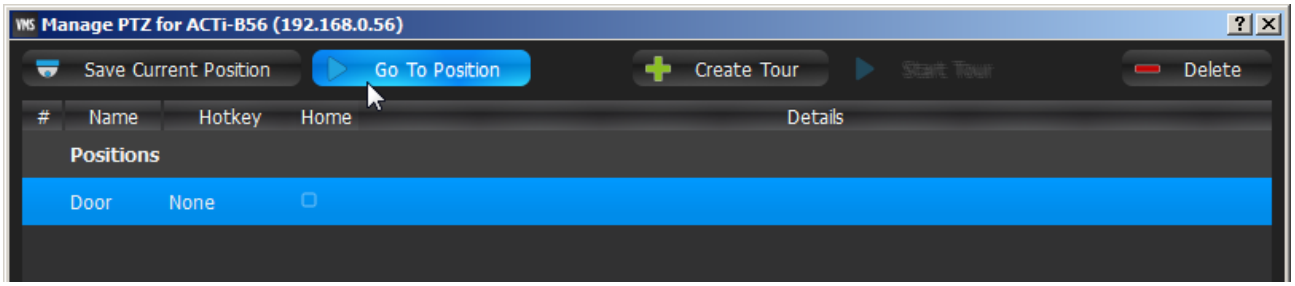
2. Move the form aside, so that the item and its PTZ controls are fully accessible (as shown at the picture above).
3. Set up a desired **PTZ Position** on **Camera** using **PTZ Controls** (see "Setting up PTZ on PTZ and Fish-Eye Cameras").
4. Click *Save Current Position*.
5. To edit positions set *Hotkey* and *Name* if necessary.
6. Set **Home Position** if necessary (see "Home Positions and Tours for PTZ and Fish-Eye Cameras")
7. Click *Apply* or *OK* when finished. To discard changes, click *Cancel*.

Restoring PTZ positions:

Open Context Menu and choose *PTZ... -> Go to Position... ->* ***<Desired position>*** or press the predefined hot key (***0-9***).

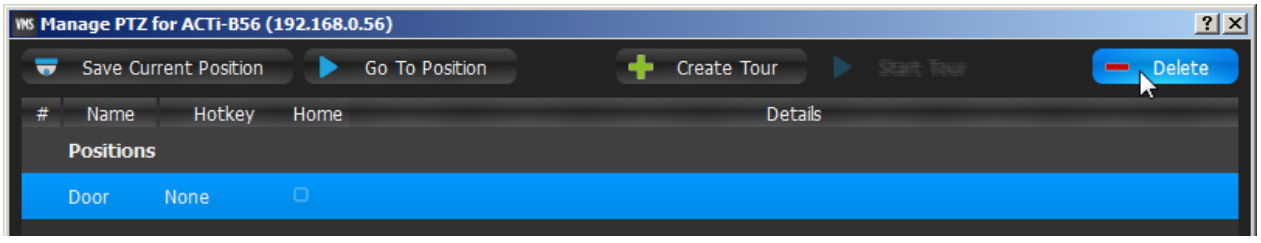


It is also possible to restore **PTZ Positions** in **Manage PTZ** window (*Go to Position*):



Deleting PTZ positions:

1. Open Context Menu and select *PTZ... -> Manage* ...
2. Select a desired preset and Click *Delete*.



IMPORTANT. If **Position** is included in **Tour**, the deletion may make this **Tour** invalid.

3. Click *Apply* or *OK* when finished. To discard changes, click *Cancel*.

Setting Up PTZ Tours

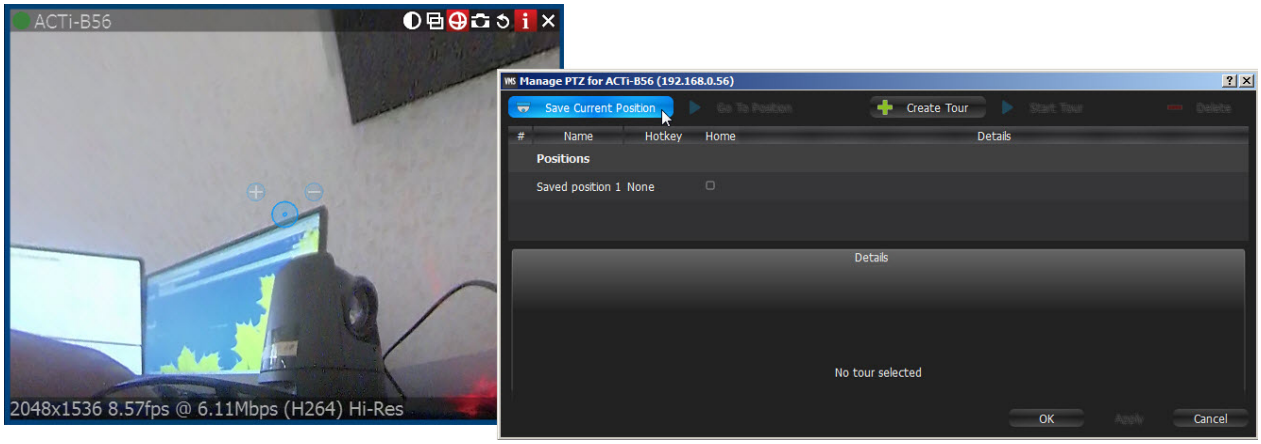
Qulu allows to create **PTZ Tours. PTZ Tour** is a sequence of **PTZ Positions**. It may be useful to move from one position to another automatically in a cycle to observe large locations by a single **Camera**.

The following parameters can be configured for **PTZ Tours:**

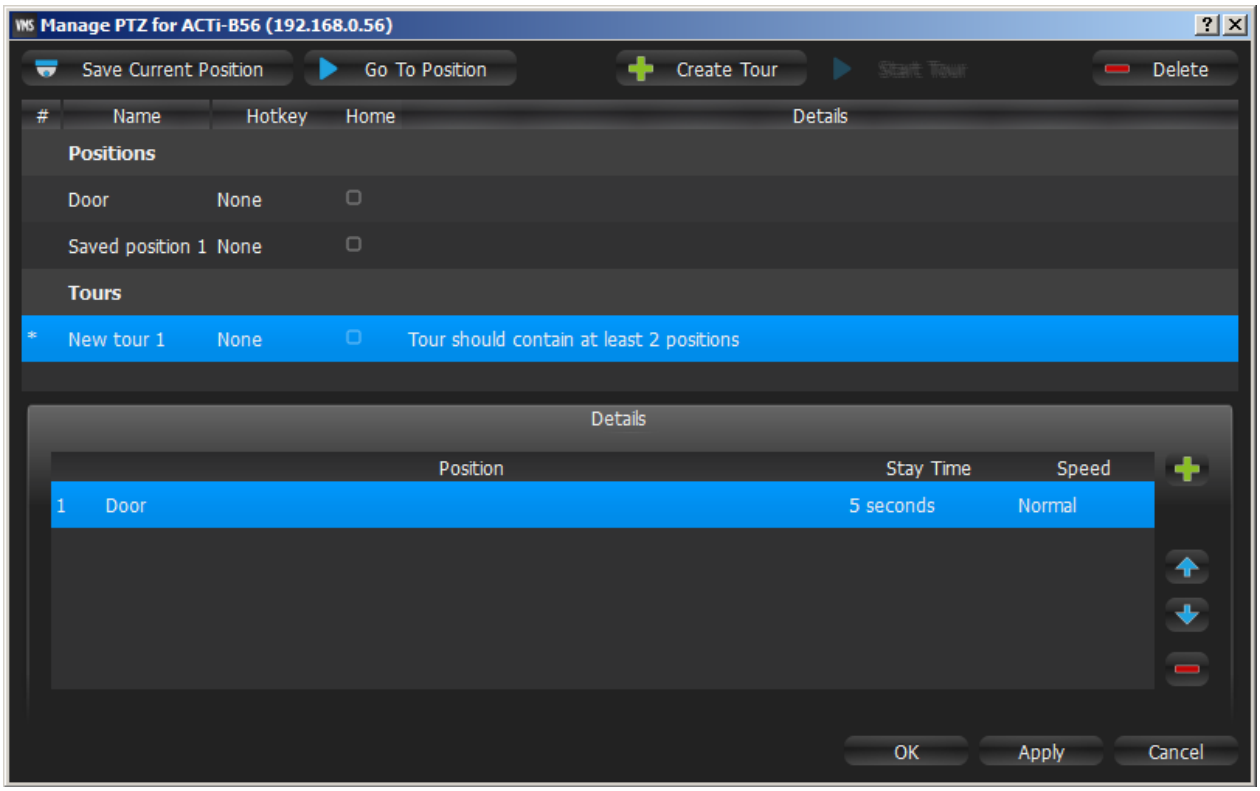
- **Positions**. **Tour** can contain an unlimited number of **PTZ Positions**.
- **Stay Time** - the duration of time for **Camera** to stay on **PTZ Positions**.
- **Speed** - the speed of **Camera** moving between **PTZ Positions**.

To configure **PTZ Tours**:

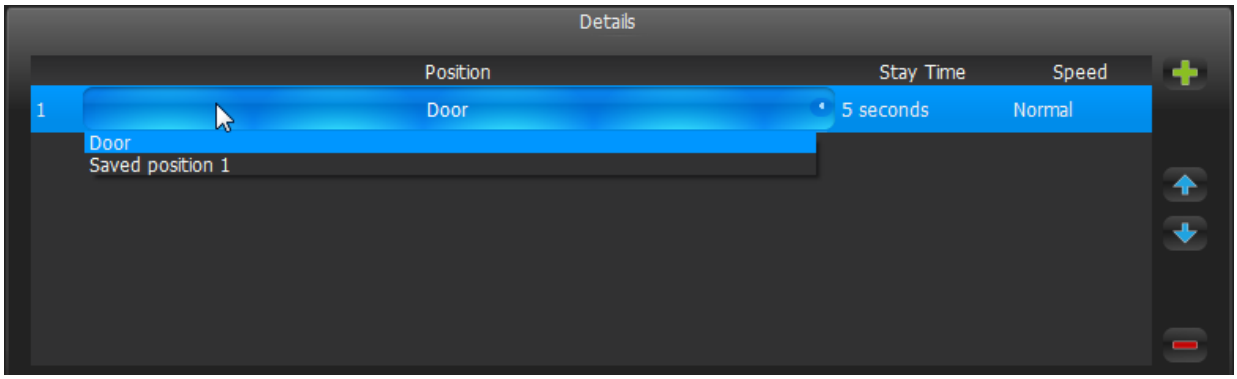
1. Open Context Menu and select *PTZ... -> Manage*. The following window will appear:



2. Move the form aside, so that the item and its PTZ controls are fully accessible (as shown at the picture above).
3. Make sure the list of positions contains a minimum of two positions.
4. Click *Create Tour*. A new item will appear in the bottom section:



5. Select **PTZ Positions** to include in **Tour**:
   - To add **Position** click on "+" button
   - To change**,** click on the desired **Position** and select another one:



   - To change the order of **Positions**, select desired **Position** and use arrows on the right to move it up and down the list.
   - To delete Position select the desired **Position** and click on "-" button.

   Note: the following restrictions are applied to **Tours**:
   - **Tour** should contain at least two **Positions**.
   - It is not recommended to use the same **Positions** in a row or select the same ones for the first and last **Position**.
   - Warning appears if **Tour** has several identical positions.
6. Set *Stay Time* and *Speed* for each **Position**.
7. Test **Tour** by clicking *Start Tour* in the upper table.
8. Rename **Tour** if necessary (in the upper table) or set it as **Home Tour** (see "Home Positions and Tours for PTZ and Fish-Eye Cameras").
9. Click *Apply* or *OK* when finished. To discard changes, click *Cancel*.

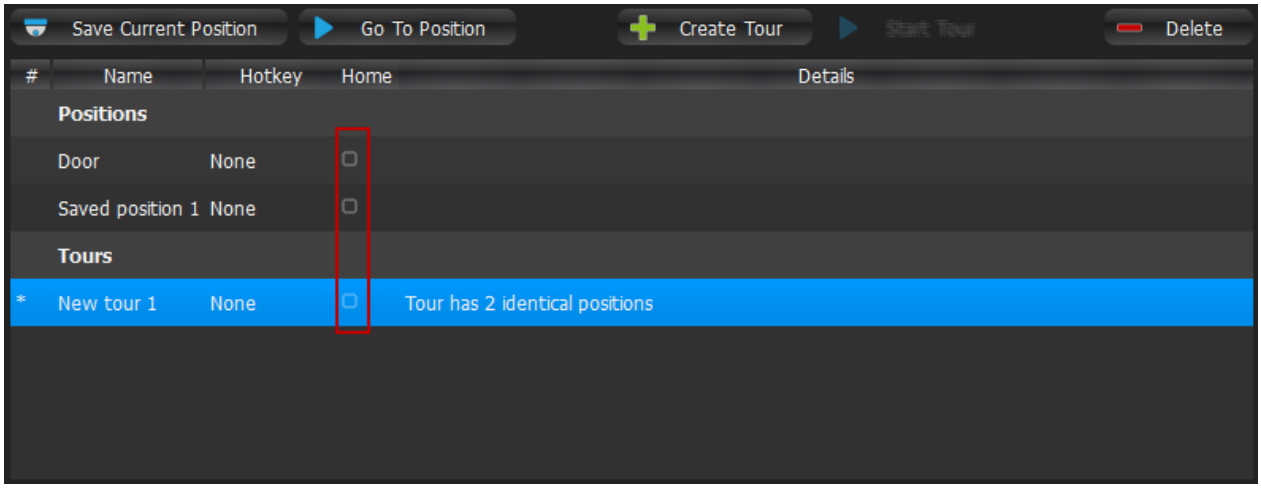
Home Positions and Tours for PTZ and Fish-Eye Cameras

Qulu allows setting **Home Position** or **Tour** for any **PTZ** or **Fisheye Camera**. **Home Position** or **Tour** will be activated on **Camera** automatically in the following cases:

- If there is no active **PTZ Tour**
- If **PTZ Position** is not changed for **Camera** for 2 minutes.

To set up **Home Position** or **Tour** for **Camera**:

1. Configure the desired **Position** (see "Saving and Restoring PTZ Positions") or **Tour** (see "Setting Up PTZ Tours").
2. Open PTZ Positions and Tours management dialog:



3. Choose the desired **Position** or **Tour** on top and check *Home*.

   Note: only one **Position** or **Tour** can be active.

4. Click *Apply* or *OK* when finished. To discard changes, click *Cancel*.

Setting up Recording Schedule

To record **Camera**, **Recording Schedule** must be set up first.

Note: It is possible to configure **Cameras** for **Administrators** and **Viewers** with an appropriate **permission** level.

Note: To record one camera, **License** is required. See "Obtaining and Activating Qulu Licenses (Admin Only)". Even if recording is not performed immediately, the **License** will still be considered as **used**.

The recording schedule specifies the following recording parameters:

- Recording **Type**:
  - **Record Always**
  - **Motion Only** – records only when motion occurs. Motion recording may require for the camera to support motion detection.
  - **Motion + Lo-Res Always** – by default, a camera is set to record at low resolution unless motion occurs, at which point it switches recording to high resolution automatically. High resolution recording requires dual streaming (if supported by camera). See "Dual Stream Recording Specifics (RADASS)"

  Motion Mask and Motion Sensitivity may need to be configured as well (see "Setting up Motion Mask and Motion Sensitivity").
- **FPS**
- **Quality**

Note: **FPS** and **Quality** recording settings will affect live stream viewing as well. For example, if **1 FPS** and **Low Quality** are set in the recording schedule, Qulu will stream live as per selected settings even if the camera is capable of more. If recording is not set, Qulu will stream live at **Maximum FPS** and **Quality**.

Those settings are applied to **Recording Schedule**. See "Modifying Recording Schedule" for details.

Dual Stream Recording Specifics (RADASS)

Some **Recording Parameters** may need **Motion** to be supported by the **Camera. Motion + Low Quality Always** recording requires **Dual-Streaming** to be supported by **Camera**.

If **Dual-Streaming** is supported, the second stream settings are set automatically based on the main recording settings:

- 2 to 7 FPS
- 320p to 480p

Not only is the second stream used for recording, it is also used for **Software Motion Detection** and **bandwidth and CPU saving during playback**. See "Setting up Motion Mask and Motion Sensitivity" and "CPU and Bandwidth Saving during Playback (RADASS)".

Modifying Recording Schedule

Qulu provides a powerful and flexible schedule for configuring recording parameters.

A specific date and time can be set in the recording schedule as well.

Examples:

- Workdays 8AM-8PM – record Always, 24 FPS, high quality
- Weekends and Workdays 8PM-8AM – record motion only, 10 fps, low quality

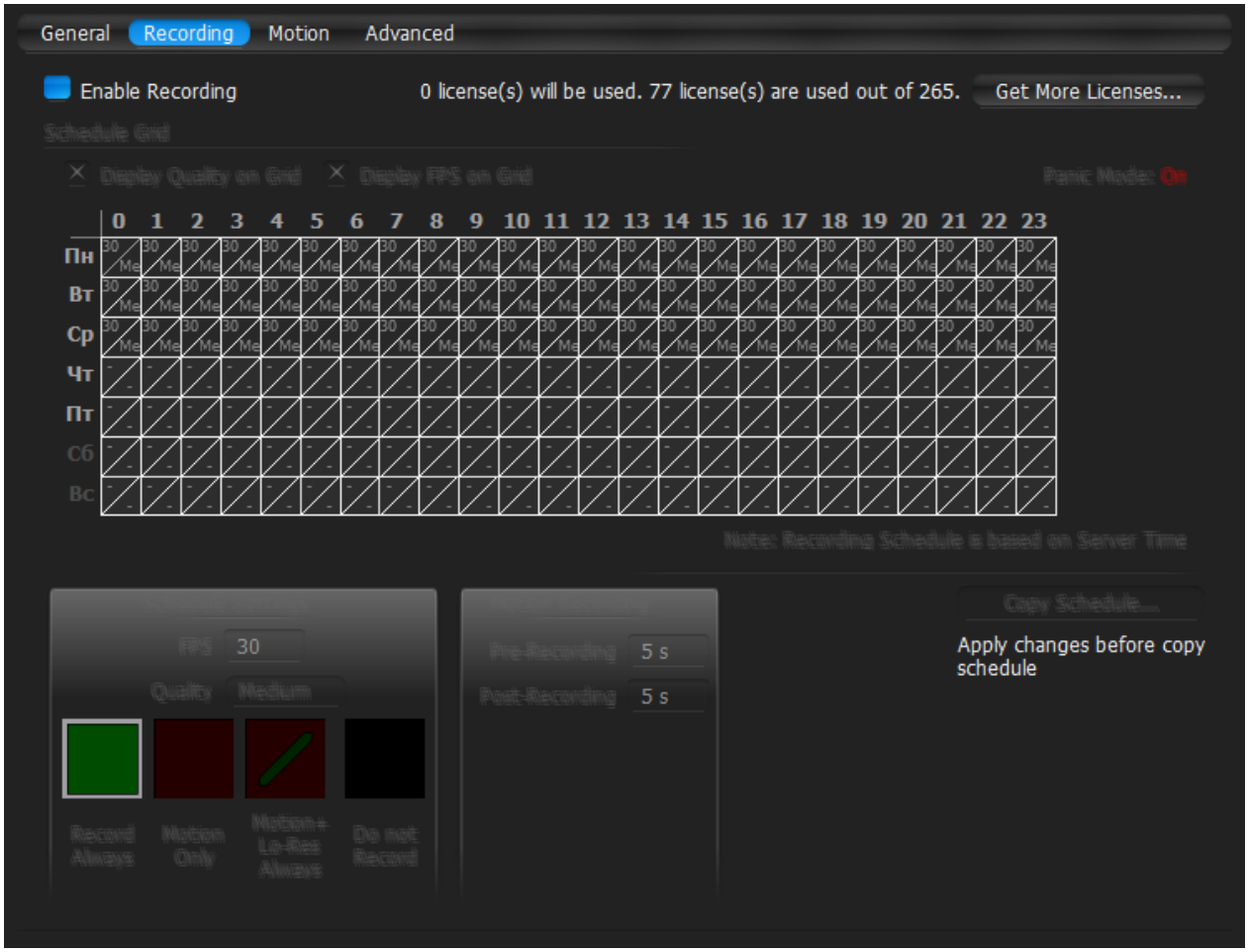
The cameras recorded by Media Servers are marked with a small red circle in Resource Tree:

- ● – camera in recording mode
- ○ – camera recording is setup, though not recording at the moment (a license is still being used)

Note: It is possible to configure **Cameras** for **Administrators** and **Viewers** that have appropriate **permissions**.

To set up **Recording Schedule**:

1. Open Camera Settings and go to *Recording*:



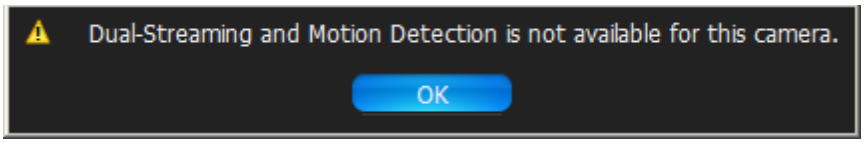
IMPORTANT. If **Media Server** and **Client** are in different time zones the schedile displays **Server Time**.

2. Click *Enable Recording*. Check the number of licenses used. If the number is insufficient, click *Get More Licenses* and proceed with activation.

   Click on *Display FPS on Grid* and *Display Quality on Grid* to show/or hide FPS and quality in grid cells.

3. Select **Recording Mode**:
   - **Record Always**
   - **Motion Only** – recording will start if motion occurs. To specify a range for motion recording, use *Record before motion* and *Record after motion* selectors. Motion detection must be supported by the camera (Software or Hardware).
   - **Motion + Low Quality Always** – low quality stream is recorded always and is switched to high quality streaming once in case of any motion. To use this recording setting, make sure the camera supports dual-streaming.

   If not the following will be displayed:



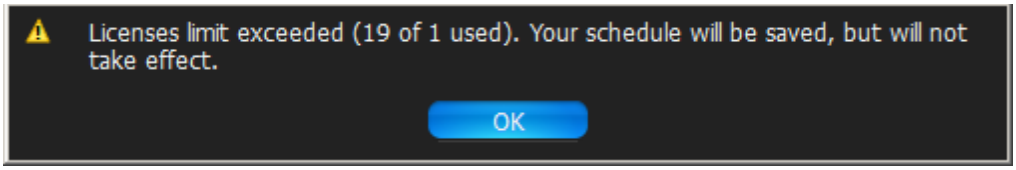
   - **Do not Record**
4. Select **Recording Quality**
5. Select **FPS**

IMPORTANT. If making any changes to image parameters for **Camera** is prohibited for Qulu, then **FPS** and **Recording Quality** changes will not take effect. See "Preventing Qulu from Changing Camera Streaming Settings (Admin Only)" for details.

6. As soon as all the parameters are selected, click on **Schedule Grid**:
   - **Click and Drag** to select multiple cells
   - Click on **hour** to select an entire column
   - Click on **weekday** to select an entire row
   - Click **Schedule Grid's** top left corner to select all cells

   Note: to select same values, hold ***Alt*** and click on the cell to choose a recording mode, FPS and values.
7. Repeat to set another recording for different cells
8. If **Motion Recording** is set, it is possible to adjust *Pre-recording* and *Post-Recording* intervals (the time range between the start and end of motion recording).
9. Click *Apply* or *OK* when finished. To discard changes, click *Cancel*.

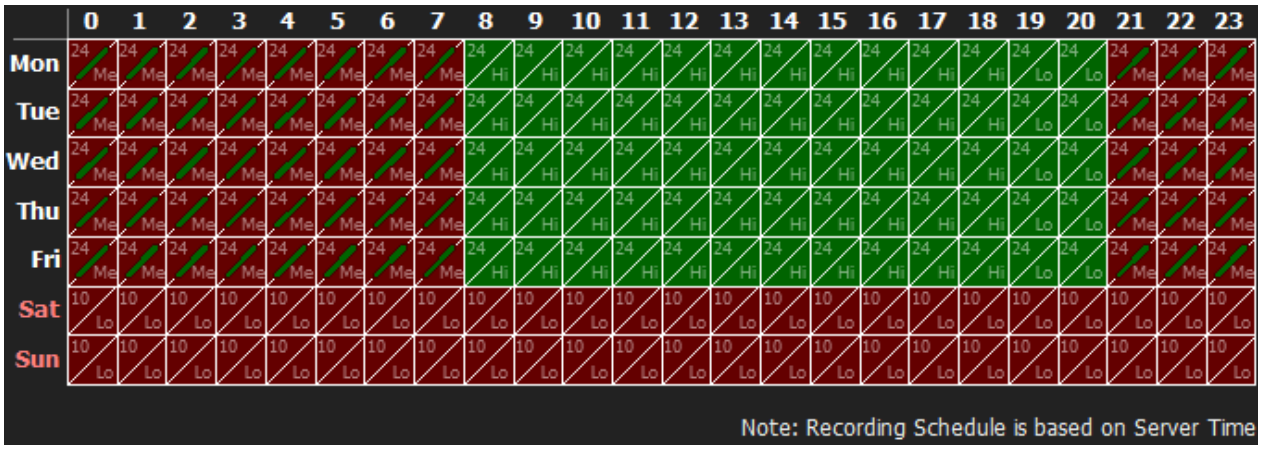
   In case of insufficient licenses, the following warning will appear:



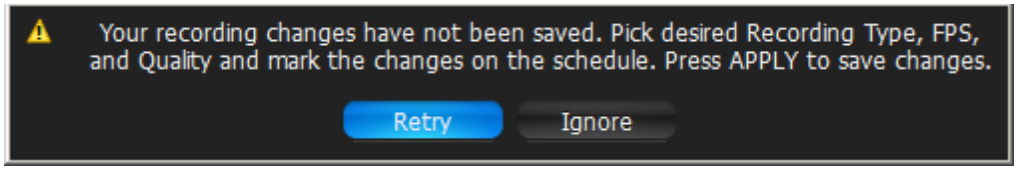
   Enable Recording flag will be disabled; however, all schedule settings will be saved.

Example:

- Workdays 8AM-8PM – Record Always, 24 FPS, High
- Workdays 8PM-8AM – Motion + Low Quality Always, 24 FPS, Medium
- Weekends – record motion only, 10 fps, Low



IMPORTANT. Make sure to apply all recording selections to the schedule once selected (recording type, FPS and quality). The following message will appear in case the selection is not applied.

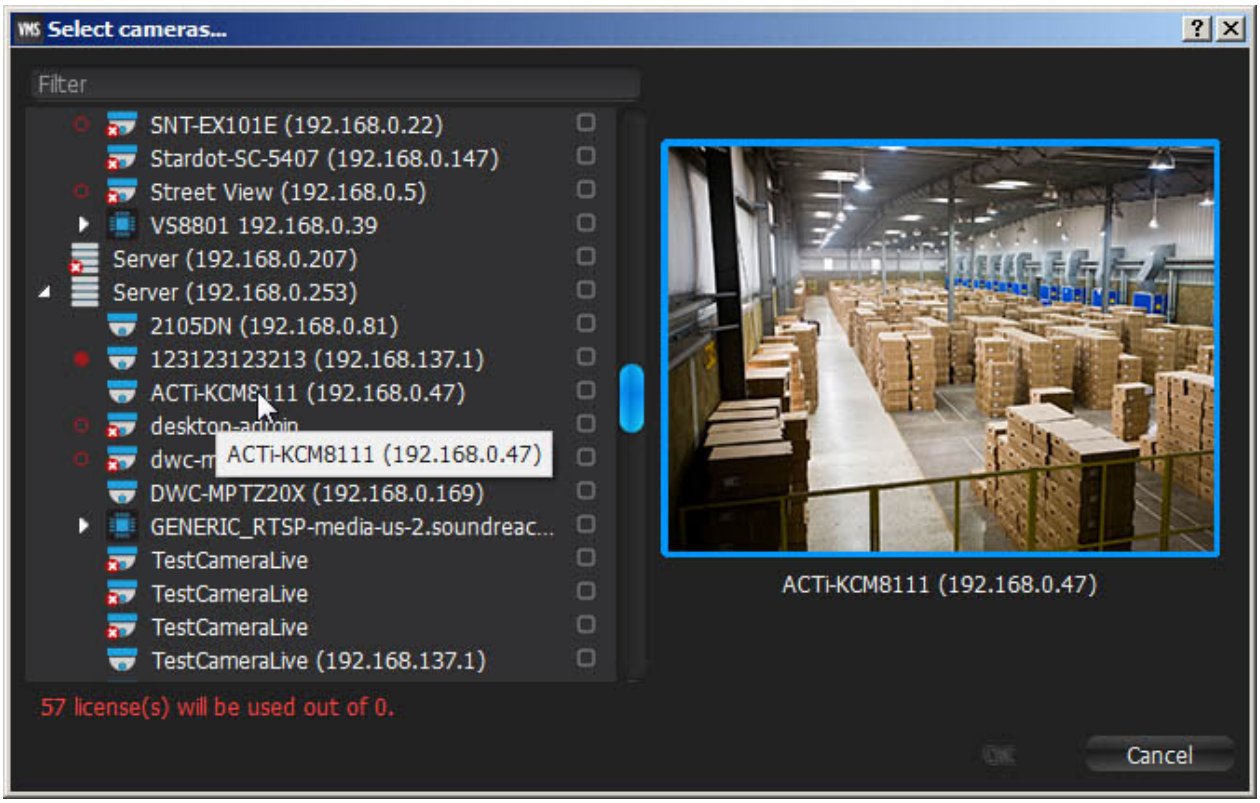

Your recording changes have not been saved. Pick desired Recording Type, FPS, and Quality and mark the changes on the schedule. Press APPLY to save changes.
Retry
Ignore

Copying Recording Schedule between Cameras

If **Recording Schedule** is already set up on **Camera** it may be needed to copy the settings to a different one. For instance, if a new camera is plugged in it is much more convenient than set up a schedule separately.

To copy Recording Schedule:

1. Open **Camera** the schedule should be copied from, go to Camera Settings -> *Recording*:
2. Click on the *Copy Schedule* button. The following form will be opened:



3. Check desired **Cameras** the schedule should be copied to. To select all **Cameras** on specific **Server** check it. To filter search use the *Filter* box. Filter criteria is the same as search (see "Search"). If hover with a mouse cursor on **Camera**, the actual picture from this **Camera** will be displayed on the right.

   Note: additional **Licenses** may be needed. See "Obtaining and Activating Qulu Licenses" for details.

4. Click *Apply* or *OK* when finished. To discard changes, click *Cancel*.

Setting up Motion Mask and Motion Sensitivity

In order to detect motion more properly and accurately, Qulu provides a powerful and flexible **Motion Detection** configuration. For example, if a camera is pointed at a parking lot, motion mask can be set on all the surrounding areas that are not targeted for recording. In this case, any motion appearing in the areas surrounding the main target area, will not trigger motion detection and recording.

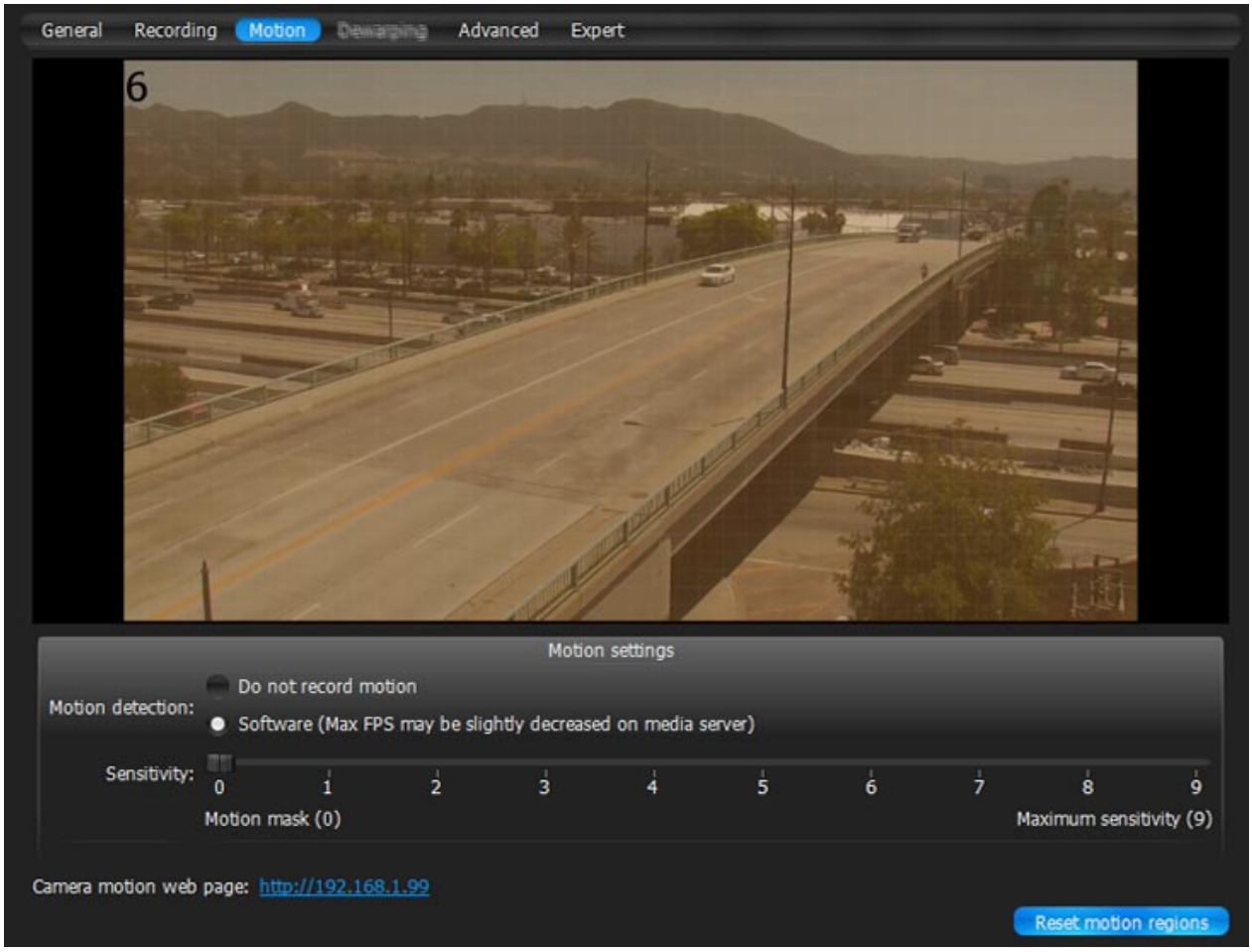
IMPORTANT. This particular feature in Qulu works only if the selected camera supports **Motion Detection**.

The following **Motion Detection** types are supported:

- **Hardware Motion Detection** – implemented on **Cameras** directly. In this case only motion mask can be configured. To configure additional parameters it may be necessary to go to **Camera Settings web page (**see "Configuring Proprietary Camera Parameters"). For **Arecont Vision** this mode is set **automatically**.
- **Software Motion Detection** is performed on **Media Server**. It consumes more resources, though it provides better and more flexible motion detection. In this case, it is possible to set up unlimited number of motion regions and adjust its sensitivity. **Software Motion Detection** requires **Dual-Streaming** supported by **Camera**. If supported, **Software Motion Detection** is set **automatically** (excluding **Arecont Vision** cameras).

To set up **Motion Detection:**

1. Open Camera Settings and go to *Motion*:

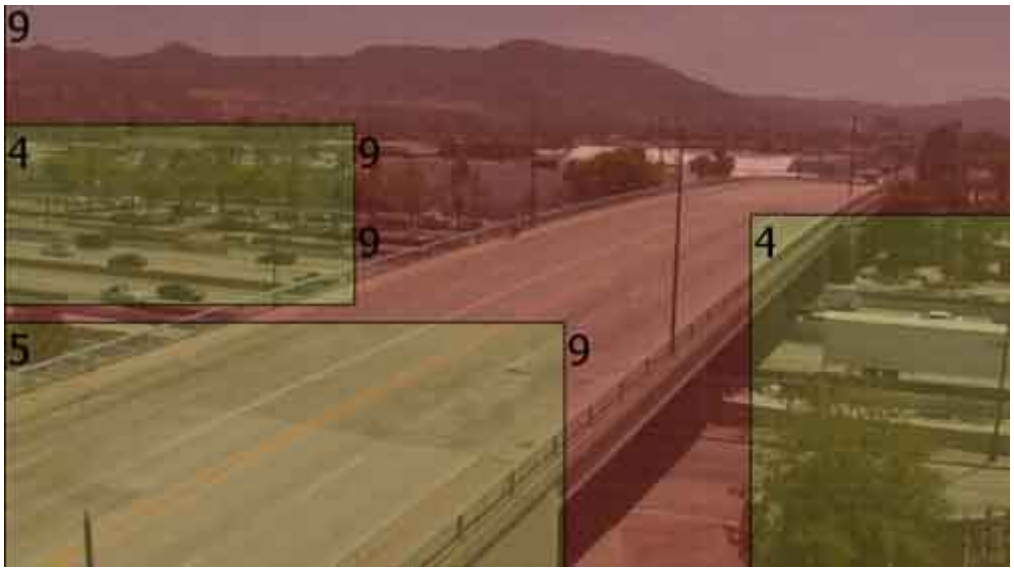


   If red zones appear on the grid during motion, **Motion Detection** is supported. Red cells indicate the level of motion (the higher the motion level, the brighter the cells).

2. Select the type of motion detection (**Hardware** or **Software**). If none are active, the camera does not support Motion Detection at all.
3. Select *Sensitivity* on the slider. 0 is motion mask (minimal sensitivity, motion will not be detected on the selected region); 9 is the highest sensitivity.

4. Select the desired regions the sensitivity will be applied to:
   - **Click and Drag** to select a single region
   - **Ctrl** + **Click and Drag** to add another region
   - **Click** on a region to fill it with desired sensitivity

   To set **Motion Mask** just **Click and Drag**. There is no need to adjust *Motion Sensitivity*.
5. Repeat for each desired sensitivity. Use *Reset Motion Regions* to start over.



   The above picture illustrates the following:
   - the area marked in grey will not capture motion (**Motion Mask**)
   - the green area will capture motion with very low sensitivity
   - top right and bottom left corners will capture motion with standard sensitivity
   - for other regions, the sensitivity will be high.
6. Click *Apply* or *OK* when finished. To discard any changes, click *Cancel*.

It is possible to set up motion directly from camera's web page. For this purpose, use *Camera Motion Web Page* link on the *Motion* tab.

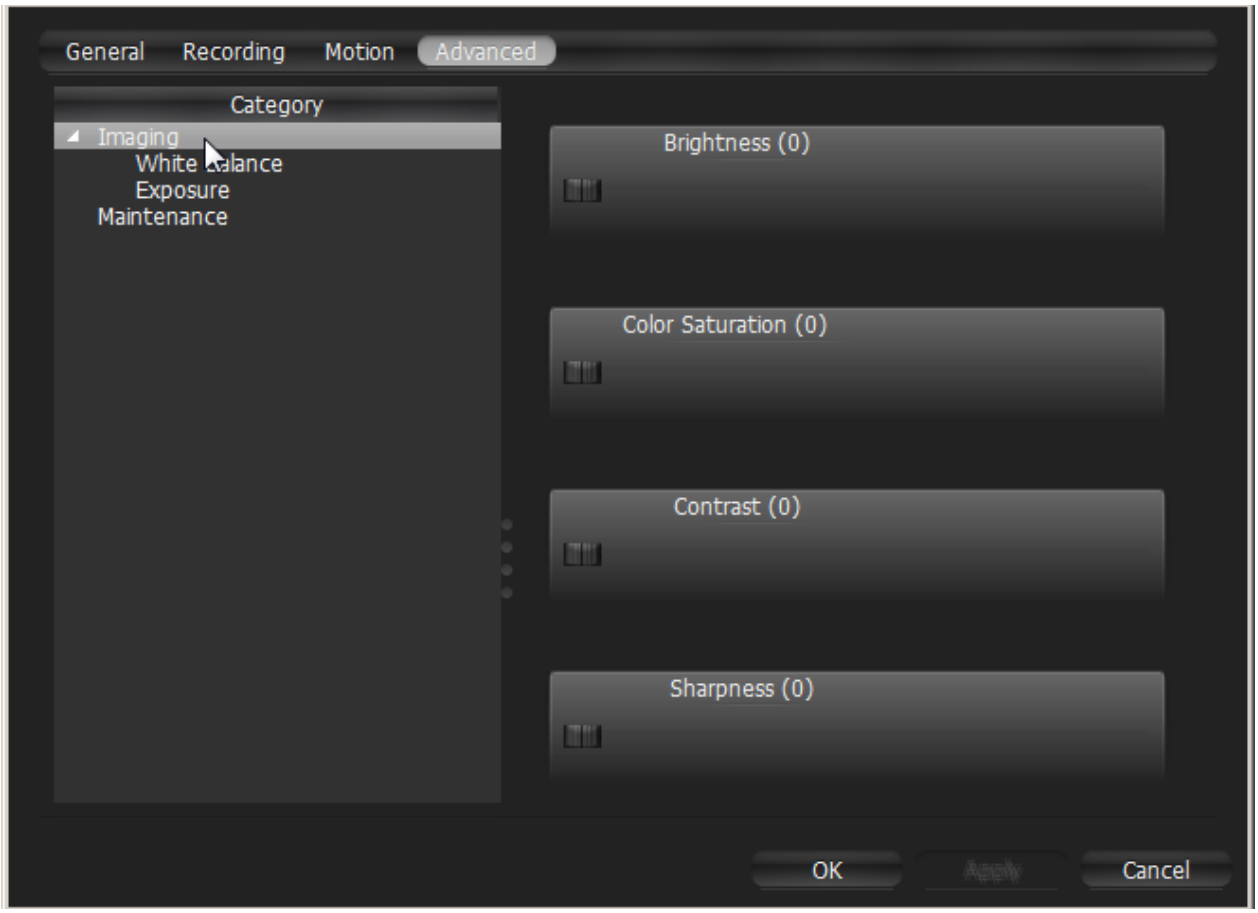
Configuring Proprietary Camera Parameters

Qulu allows configuring basic image settings inside the software. These settings are available for **Onvif-compliant cameras only.**

Note: It is possible to configure **Cameras** for **Administrators** and for **Viewers** that have the appropriate **permissions**.

To go to proprietary camera settings:

1. Open Camera settings and select *Advanced*.
2. Configure desired **Camera Parameters**:



Note: If the list is empty, Camera does not support configuring (not Onvif-Compliant).

All settings are applied **immediately**. Best practice is to leave a video Item on the **Scene** while configuring its parameters.

Other proprietary camera parameters such as Authorization, Network Settings etc. can be configured directly from camera's web page.

1. Open Camera settings and select *General*.
2. Enter **Authentication Parameters** if the camera requires authentication (Admin only).
3. Click on *Web Page*. The browser will open camera's web page.

Web page may be inaccessible because it can be located on a different network. To check camera accessibility, press the *Ping* button prior to opening the web page.

Additionally, the following can also be performed:

- Resetting Camera.

Resetting Camera

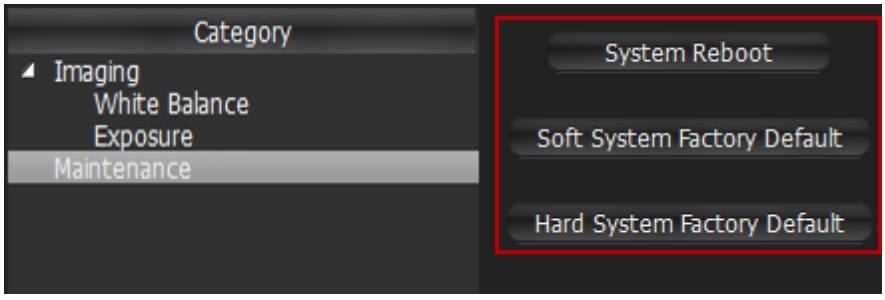
Qulu allows for cameras to be reset to factory defaults. These settings are available for **Onvif-compliant cameras only**.

Note: It is possible to configure **Cameras** for **Administrators** and **Viewers** with an appropriate **permission** level.

To go to proprietary camera settings:

1. Open Camera settings and select *Advanced*.
2. Go to *Maintenance*.

   Note: If the list is empty, Camera does not support configuring (not Onvif-Compliant).
3. Choose one of the following:
   - *System Reboot* – reboot **Camera** and save settings
   - *Soft System Factory Default* – reboot **Camera** and restore all settings related to the image
   - *Hard System Factory Default* – reboot **Camera** and restore all settings (Network, Authorization, etc).



The reboot is performed instantly once selected.

It is also possible to reboot **Camera** from its **Web Page**. See "Configuring Proprietary Camera Parameters".

Adjusting Secondary Stream Quality

Qulu's architecture provides significant CPU and network bandwidth savings by acquiring multiple streams from a single camera: **High Resolution** (regular) and **Low Resolution** (approximately x10 less bandwidth). The second stream is always decoded by Media Server and is used for the following:

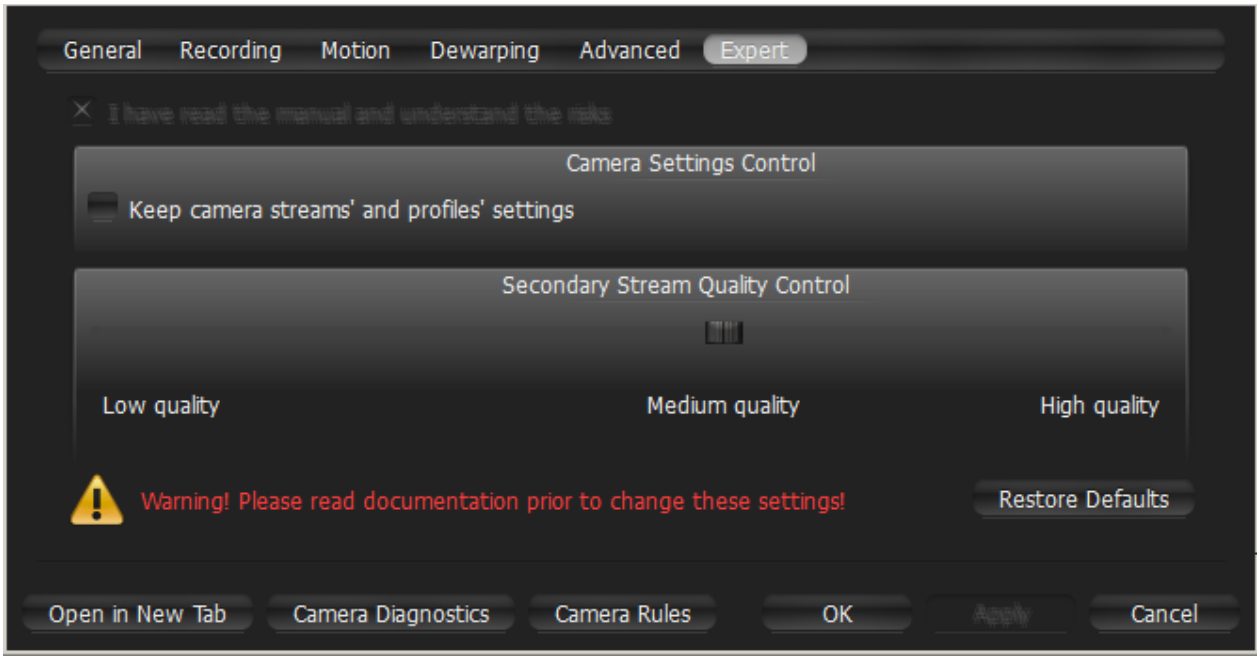
- Software Motion Detection
- CPU and Bandwidth Saving during Playback (RADASS)

The quality of the second stream is set automatically, however, it is possible for **User** to adjust the quality of the stream.

IMPORTANT. Higher quality of the second stream provides for a much better look and feel (especially on larger monitors), but can significantly increase CPU load on **Media Server**. It is not recommended to change these settings.

To adjust the quality of the second stream:

1. Open Camera Settings and go to *Expert*.
2. Check *I have read the manual and understand the risks*.
3. Adjust *Secondary stream quality*.



4. Click *Apply* or *OK* when finished. To discard changes, click *Cancel*.

Note: If **Camera** does not support dual-streaming, the above settings are unavailable.

Preventing Qulu from Changing Camera Streaming Settings (Admin Only)

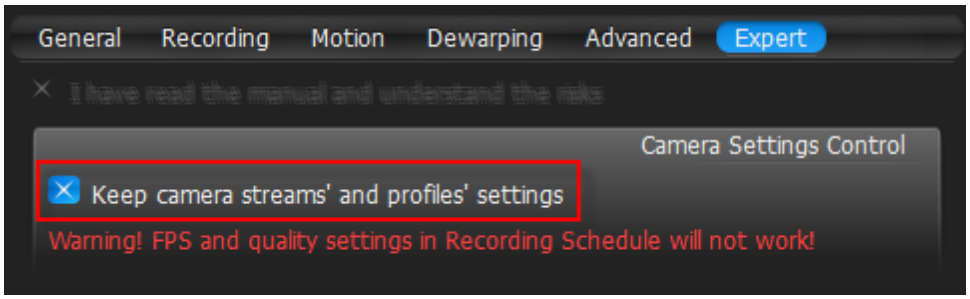
Once **Camera** is discovered, Qulu attempts to configure the following settings on **Camera**: the best possible image quality for the main video stream (best possible resolution and FPS) and optimal quality for the secondary stream.

In some cases it may be necessary to set up custom stream settings on Cameras. Qulu allows this as well.

IMPORTANT. In this case Qulu can record Camera with specified settings only. It will not be possible to set up FPS and Quality when configuring Recording Schedule (see "Modifying Recording Schedule").

To disable automatic adjustment for one or multiple **Cameras**:

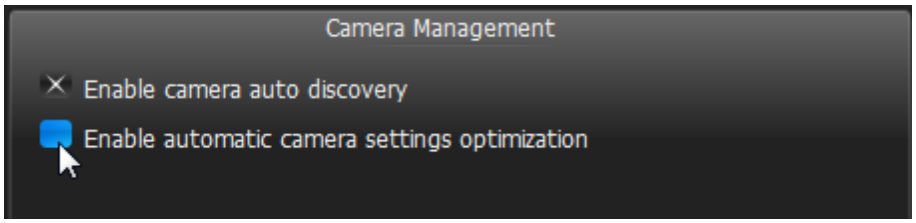
1. Stop recording of the desired Cameras and close them.
2. For each **Camera** go to its **Web Page** and set all desired image settings.
3. Select one or multiple **Cameras**, then open Camera Settings and go to *Expert.*
4. Check *I have read the manual and understand the risks.*
5. Check *Keep camera streams' and profiles' settings.*



6. Click *Apply* or *OK* when finished. To discard changes, click *Cancel*.

To disable automatic adjustment for all **Cameras**:

1. Disable recording for all cameras and close them (if opened for viewing).
2. For each **Camera** go to its **Web Page** and set desired image settings.
3. Open Main Menu and go to *System Settings –> Server*.
4. Remove *Enable automatic camera settings optimization* flag.



5. Click *OK* when done or *Cancel* to discard changes.

Setting Same Parameters for Multiple Cameras

In order to simplify the configuration process, Qulu enables users to apply same parameters to more than one camera at a time.

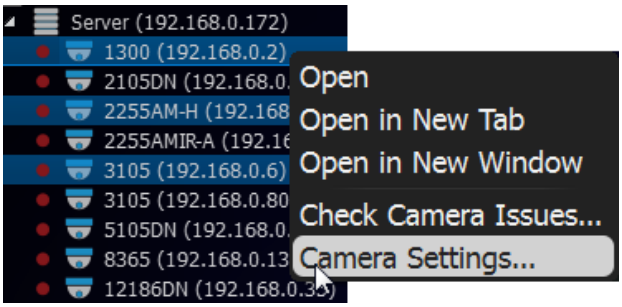
The following can be performed as a batch:

- **Authentication** setup
- **Schedule** configuration

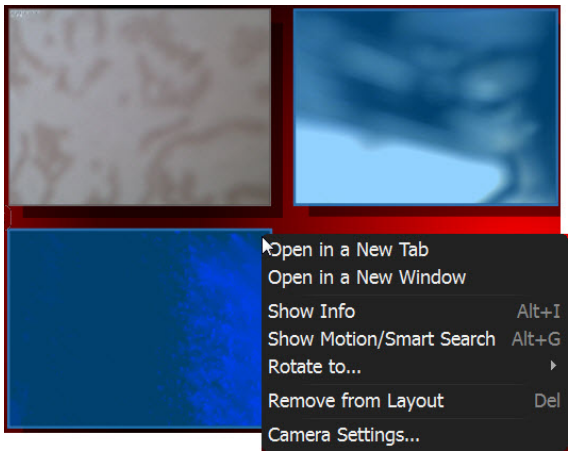
To set the same parameters for multiple **Cameras**:

1. Use Multi-Selection to select desired cameras:
   - In Resource Tree, hold ***Ctrl*** or ***Shift*** and **Click**
   - On **Scene** – use ***Ctrl*** and **Click**
2. Open Context Menu and go to *Camera Settings*.

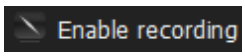
From Resource Tree:



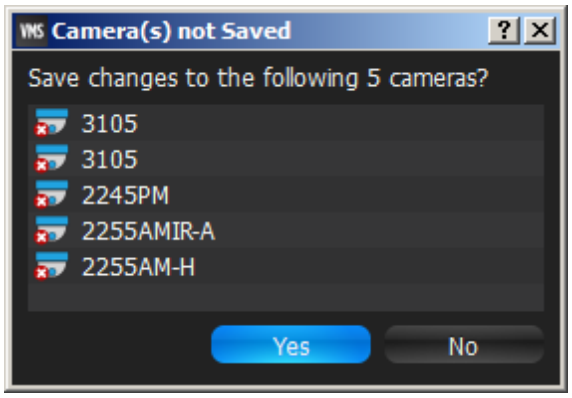
From **Scene**:



- If the selected cameras share the same **Authentication Credentials**, they will be displayed.
- If the selected cameras share the same **Recording Settings**, they will be displayed.
- If the selected cameras have different *Enable recording* field values, the field will be displayed as follows:



3. Set the desired parameters and click Apply.
   - If needed, a user can add a camera to the selection by holding the ***Ctrl*** button and clicking on the desired camera in Resource Tree.
   - To set up another camera(s), select the desired camera in Resource Tree. It is not necessary to close the settings dialog.
   - If the changes are not applied, the following warning message will appear:



4. When finished, press *OK* to apply or *Cancel* to discard settings.

Swapping Cameras between Media Servers (Admin Only)

If too many cameras are used on the network, it may be helpful to set up an additional server for load balancing and redundancy purposes. If several servers are set up on the same network, it is possible to perform **manual load-balancing**.

This is how camera swapping works:

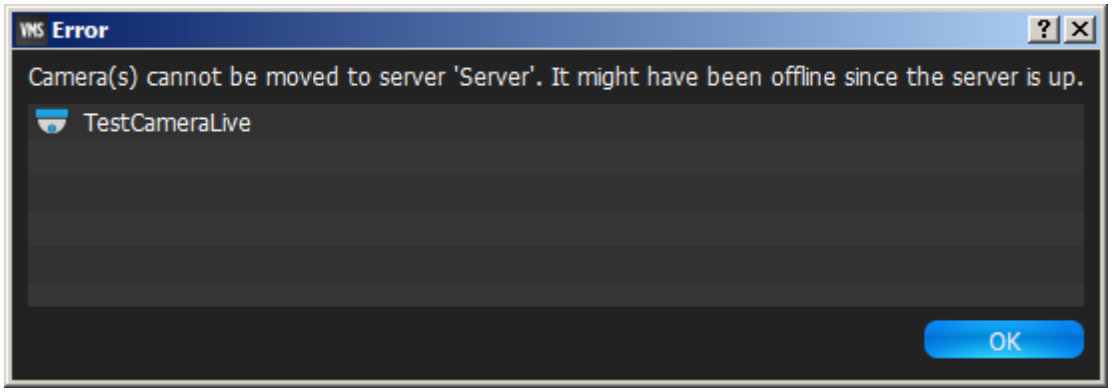
1. Step 1: **Media Server** is connected to **EC** and starts discovering **Cameras**. As soon as **Cameras** are discovered, they will appear in the **Client**.
2. Step 2: **Media Server** is connected to **EC** and starts discovering **Cameras**. As soon **Cameras** are discovered, their **MAC Addresses** are checked. If **Camera** is registered on **Media Server**, it will not appear in the **Client** and a "**Disabled**" flag is set in the database.
3. Once **Camera** is moved to another **Media Server**, it becomes **Enabled** in the second **Media Server** and automatically disables itself in the first one.

IMPORTANT. When moving **Camera** from one **Media Server** to another, recording will be restarted automatically (with predefined parameters). Also, **Archive** is seamlessly **combined** from all servers.

To move camera(s) from one server to another:

1. Hold ***Ctrl*** or ***Shift*** to select the desired cameras in Resource Tree
2. **Drag and drop** the selected cameras to the desired server

IMPORTANT. In order to move **Camera** from one **Media Server** to another, the cameras must be discovered by both servers. If not, the following warning will appear:

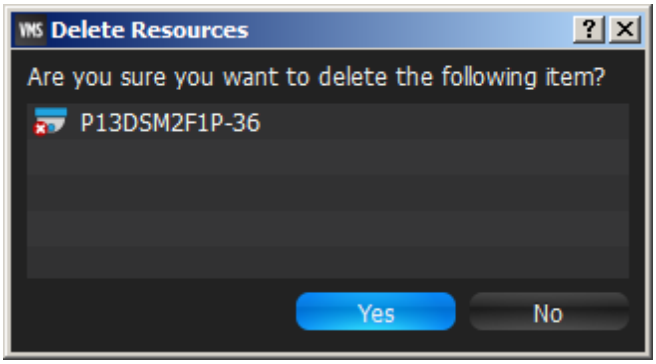


Deleting Cameras (Admin Only)

IMPORTANT. **Camera must be offline** (unplugged from the network) to be deleted.

To delete **Camera**(s):

1. Expand the **Media Server** hosting the desired server in Resource Tree.
2. Find and select **Camera**.
3. **Right-Click** for Context Menu and choose *Delete* (or the ***Del*** button on a keyboard).
4. Click *Yes* to confirm.



If **Camera** is back online, it will start working **immediately**. Recorded archive will be available as well; however, a user will need to reconfigure **Camera** as its settings have been erased. To prevent this from happening, **User** must disable automatic discovery. See "Disabling Automatic Discovery (Admin Only)" for details.

Configuring Events and Actions (Admin Only)

Qulu provides powerful and flexible event bus than can be used for simple and intuitive programming of any algorithm.

Algorithms are a set of **Rules**. Each **Rule** is a combination of **Event**-**Action**. As soon as **Event** is fired up, Qulu triggers the appropriate **Action**.

The following events and actions are supported:

Events:

- Motion on Camera
- Camera Disconnection/Malfunction
- Storage Failure
- Network Issue
- Camera IP Conflict
- Input Signal on Camera
- Media Server Failure
- Media Servers Conflict
- EC Connection Lost
- Licenses are Not Configured
- E-mail is not Set for Users
- Storages are not Configured.

Actions:

- Notifications
- Visual Event Indication
- Mail Notifications
- Start Recording on Camera
- Start Panic Recording
- Trigger Camera Output
- Play Sound
- Speak.

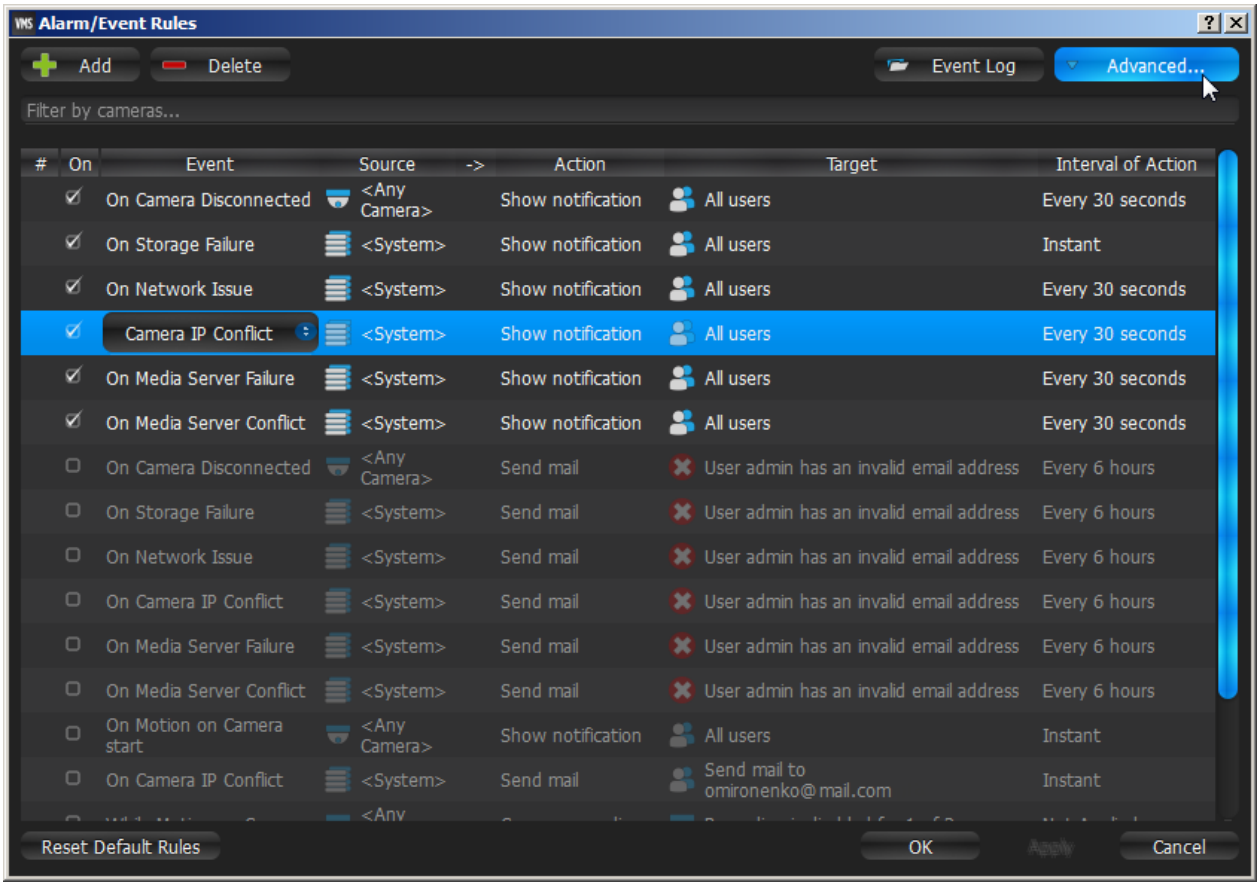
Every **Event** that has occurred is automatically saved in system's **Event Log**. If no **Rules** are active, only system issues will be saved. See "Viewing Events Log" for details.

IMPORTANT. Some default **Rules** are already configured. See "Default Rules" for details. It is possible to reset all **Rules** configurations to default settings. To reset, click on R*eset Default Rules* and *Apply* or *OK*. All previously configured Rules will be discarded.

To configure **Rules**:

1. Do one of the following:
   - To configure **Global Rules**: open Main Menu and go to *Alarm/Event Rules* (or press ***CTRL + E***). It is possible to configure Rules for specific Camera(s). To proceed, type the desired **Camera** name, IP or MAC address into the *Filter* box. Only **Rules** that are applied to a corresponding **Camera** will be displayed.
   - To configure **Rules for a single Camera**: open Camera's Context Menu and select *Camera Rules* or open Camera Settings, then click *Camera Rules*...

   The following dialog will open:


Alarm/Event Rules
Add
Delete
Event Log
Advanced...
Filter by cameras...
On Event Source -> Action Target Interval of Action
On Camera Disconnected <Any Camera> Show notification All users Every 30 seconds
On Storage Failure <System> Show notification All users Instant
On Network Issue <System> Show notification All users Every 30 seconds
Camera IP Conflict <System> Show notification All users Every 30 seconds
On Media Server Failure <System> Show notification All users Every 30 seconds
On Media Server Conflict <System> Show notification All users Every 30 seconds
On Camera Disconnected <Any Camera> Send mail User admin has an invalid email address Every 6 hours
On Storage Failure <System> Send mail User admin has an invalid email address Every 6 hours
On Network Issue <System> Send mail User admin has an invalid email address Every 6 hours
On Camera IP Conflict <System> Send mail User admin has an invalid email address Every 6 hours
On Media Server Failure <System> Send mail User admin has an invalid email address Every 6 hours
On Media Server Conflict <System> Send mail User admin has an invalid email address Every 6 hours
On Motion on Camera start <Any Camera> Show notification All users Instant
On Camera IP Conflict <System> Send mail Send mail to omironenko@mail.com Instant
Reset Default Rules
OK
Apply
Cancel

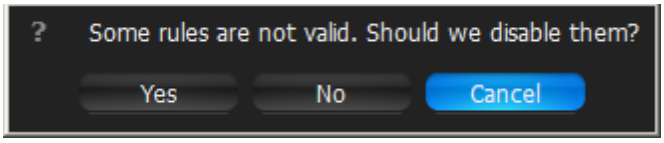
2. To add a new **Rule**, click *Add*. To delete an existing-one, click *Delete*.

3. Once added, **Rule** should be configured.
   - Select **Event** on the left-hand side that needs to be monitored. See "Tracked Events" for more information
   - Select **Action** on the right-hand side that needs to be performed once **Event** occurs. Refer to "Actions" for details
   - Specify basic parameters for **Event** and **Action**. Click on *Source* or *Target* column in the **Rule** row and choose the desired value.

   IMPORTANT. If some fields are missing or incorrect, **Rule** is considered invalid. In this case, it will turn red:

   - Set *Aggregation* period. Once set, all **Actions** will be executed once per the specified period. If not, **Actions** will be executed every time **Events** occur. Applies to Notifications, Mail Notifications, Play Sound, Speak.
   - If any additional configuration is needed, click *Advanced...* The advanced settings will be displayed on the bottom. Those settings differ from each other depending on **Events**/**Actions** that are being configured. See this chapter for more information on a specific **Event**/**Action**.
   - Add *Comments* for **Rule** if needed.
4. Set or clear the flag (on the left-hand side of each **Rule**) to enable or disable it.
5. As soon as all configurations are done, click *Apply* to accept changes or *Cancel* to discard. Click *OK* to apply changes and close the form.

IMPORTANT. If any **Rule** is considered invalid, the warning displayed below will appear. If apply the changes, incorrect **Rules** will be disabled.



Tracked Events

Qulu can react as soon as a particular **Event** occurs.

Every tracked event may have its own parameters. Refer to the particular **Event** description for more information:

- Motion on Camera
- Camera Disconnection/Malfunction
- Storage Failure
- Network Issue
- Camera IP Conflict
- Input Signal on Camera
- Media Server Failure
- Media Servers Conflict
- EC Connection Lost
- Licenses are not Configured
- E-mail is not Set for Users
- E-Mail Server is not Configured
- Storages are not Configured
- Media Server Started.

As soon as Event occurs, the **Action** can be performed. See "Actions".

Additionally, **Events** can be tracked based on the schedule. For instance, Motion can be tracked only on weekends and Input Signal – at 8PM-8AM. See "Setting up Schedule for Tracking Events" for details.

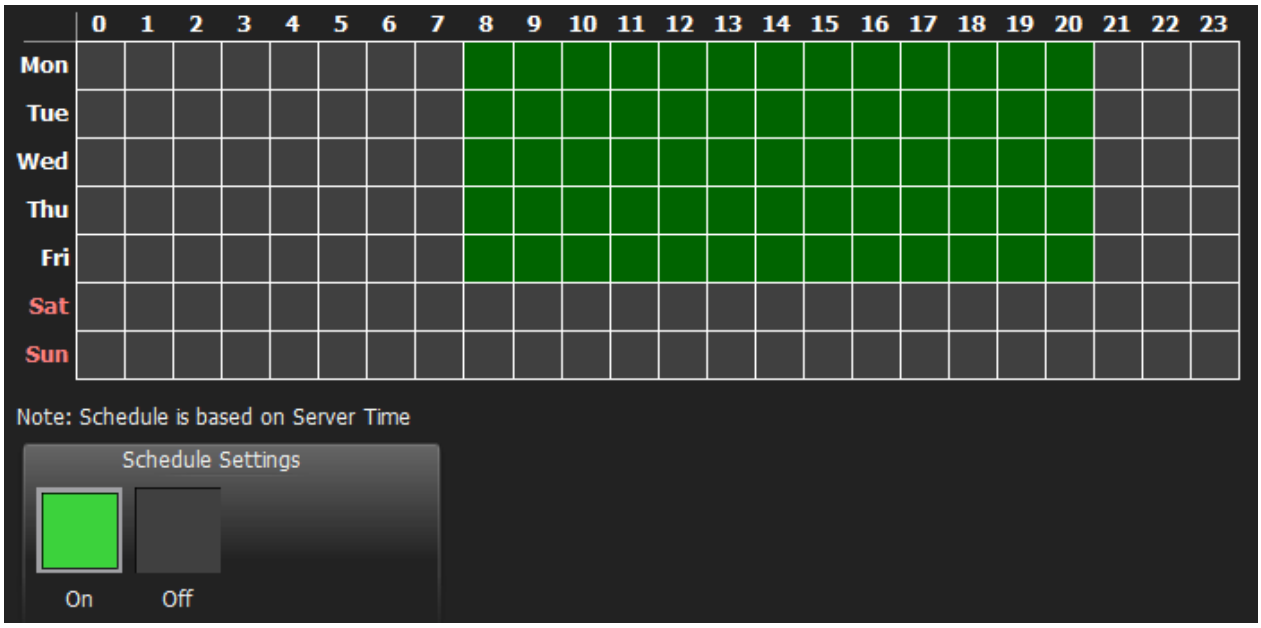
Finally, all **Events** are recorded in **Log**. See "Viewing Events Log" and "Write to Log".

Setting up Schedule for Tracking Events

Events can be tracked based on the schedule. For instance, Motion can be tracked only on weekends and Input Signal – at 8PM-8AM.

The schedule can be configured as advanced parameters for the desired **Event**:

1. Open **Event** Advanced Parameters by clicking on *Advanced* on the *Alarm/Event Rules* form. The advanced settings will be displayed on the bottom.
2. Click on *Schedule...* The following form will be displayed:



3. Select *On* or *Off* to enable/disable monitoring in particular cells.
4. Click on **Schedule Grid**:
   - **Click and Drag** to select multiple cells
   - Click on **hour** to select an entire column
   - Click on **weekday** to select an entire row
   - Click **Schedule Grid's** top left corner to select all cells

The above example shows that the event is tracked on workdays (Sun-Fri) since 8AM till 8PM.

By default, events are always tracked.

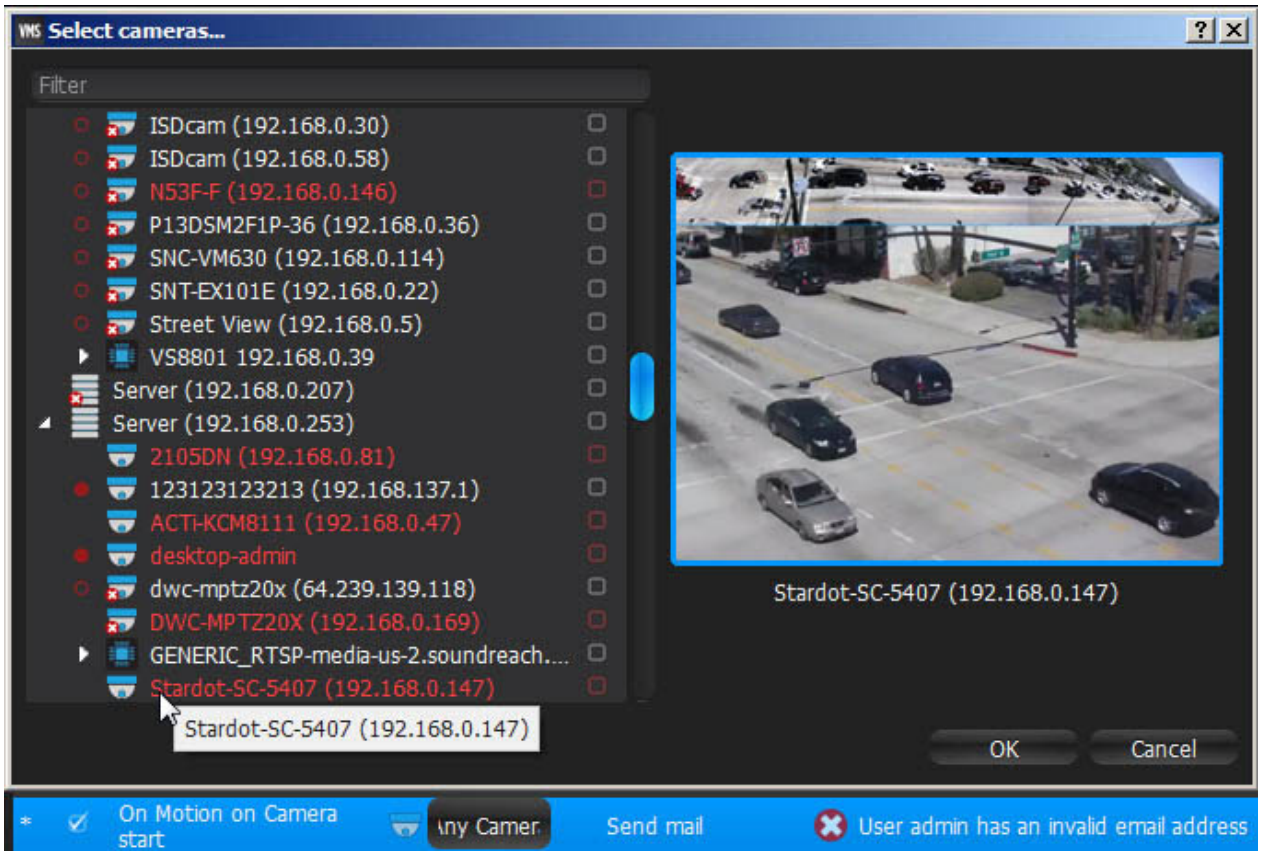
Motion on Camera

Occurs if motion is detected on **Camera(s)**.

Basic Parameters

Camera(s) motion is detected on. To specify:

1. Click on *Any Camera* at the desired row on the Alarm/Event Rules form. The following form will appear:



2. Check the cameras to detect motion, then click *OK* (*Cancel* will discard changes).

To select all **Cameras** on a specific **Server**, set the flag on it. To filter search, use the *Filter* box. Filter criterias are the same as search (see "Search"). It is possible to **Drag'n'Drop** the selected **Cameras** from Resource Tree onto the **Event**'s advanced settings form.

IMPORTANT. To detect motion, recording must **be enabled** on **Camera**. Refer to "Modifying Recording Schedule" for information on how to enable recording. If the selected **Camera** is not being recorded, then the corresponding message will be displayed (see above).

If cameras are not specified, motion will be detected on all the cameras that support it.

Advanced Parameters

Schedule (see "Setting up Schedule for Tracking Events").

Starts/Stops. Available only for instant actions (Send Mail, Show Notification, Camera Output). If no motion occurs for 3 seconds, the current motion **Event** is considered stopped. When motion occurs again, a new motion **Event** is generated.

May result in

Camera Recording.

Panic Recording.

These actions are performed while motion is taking place on at least one camera out of the selected.

Send Mail.

Show Notification.

Camera Output.

These actions will be performed if motion is detected on at least one camera out of the selected.

Why Event may work incorrectly

Recording is disabled for **Camera(s)** that are being monitored. Refer to "Modifying Recording Schedule" for information on how to enable recording for **Camera**.

Motion Mask is not set properly. See "Setting up Motion Mask and Motion Sensitivity".

Too many **Cameras** are monitored and too many **Events** occur.

Cameras that are monitored are offline.

Action is not configured properly. See the **Action**'s description for details.

Notifications for this type of **Event** is hidden in system settings. See "Notifications" for more details.

Camera Disconnection/Malfunction

Occurs if **Camera(s)** is/are disconnected for whatever reason (network, **Camera** malfunction etc.). **Camera** is considered disconnected if no data is received for 10 seconds. Once data is received from **Camera**, the status is automatically changed back to Online.

If **Camera** is experiencing network issues over a minute, then is appear in Resource Tree.

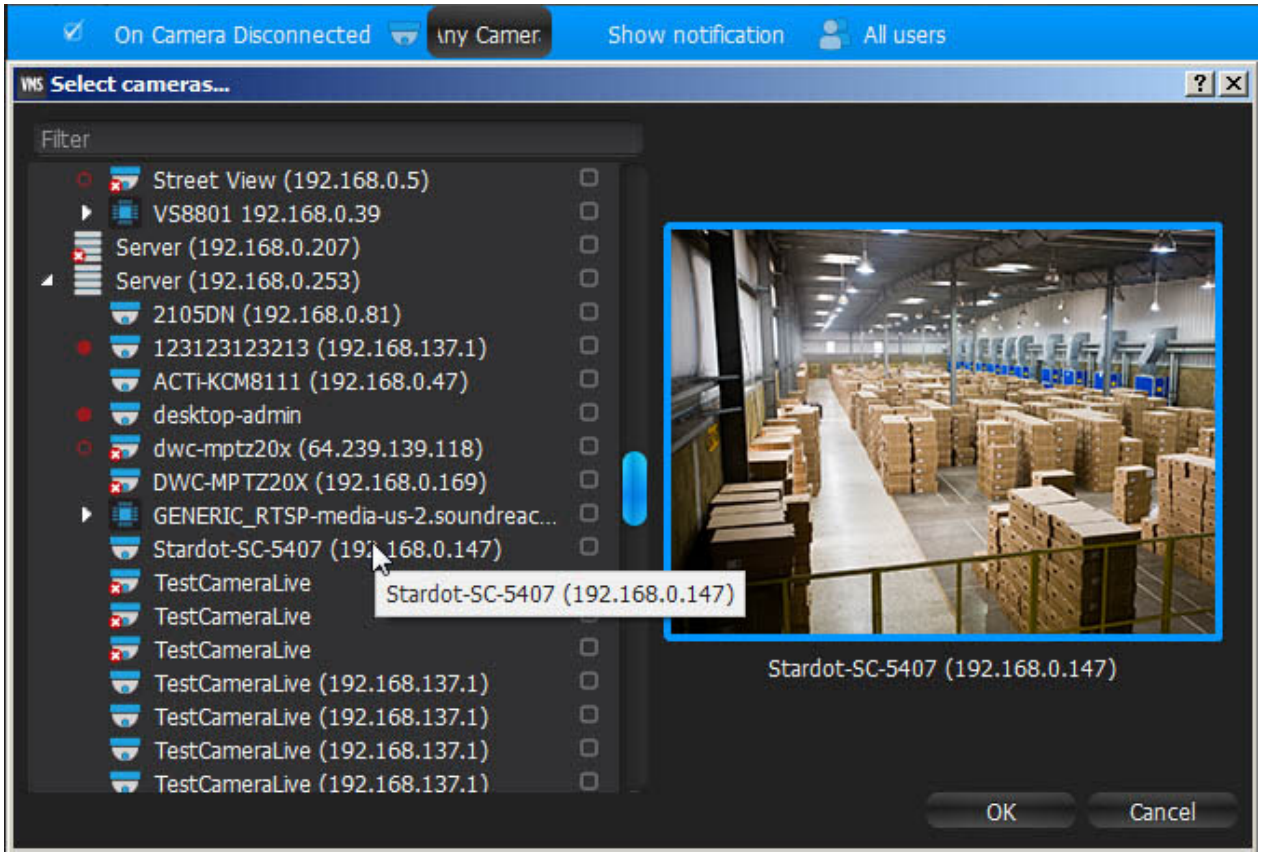
Additional **Events** may occur as well and may help to investigate the issue:

- Network Issue. This means that network is unable to transfer data between **Camera** and **Media Server**, which may be the reason why a camera goes offline.
- Media Server Failure. If **Media Server** is down, all hosted **Cameras** drop offline.
- Camera IP Conflict. If another **Camera** with the same IP enters the network, one of these two **Cameras** will go offline.
- Media Servers Conflict. If a new **Media Server** is connected to another **Enterprise Controller** on the same network and pulls data from the same **Cameras**, then some **Cameras** may drop offline because they may not provide several streams simultaneously.

Basic Parameters

Camera(s). To specify:

1. Click on *Any Camera* at the desired row on the Alarm/Event Rules form. The following form will appear:



2. Check the cameras to track, then click *OK* (*Cancel* will discard changes).

To select all **Cameras** on a specific **Server**, set the flag on it. To filter search, use the *Filter* box. Filter criteria are the same as search (see "Search"). It is possible to **Drag'n'Drop** the selected **Cameras** from Resource Tree onto the **Event**'s advanced settings form.

If **Cameras** are not specified, all **Cameras** will be monitored.

Advanced Parameters

Schedule (see "Setting up Schedule for Tracking Events").

May result in

Send Mail.

Show Notification.

Camera Output.

Why Event may work incorrectly

Too many **Cameras** are monitored and too many **Events** occur.

Cameras being monitored are offline.

Action is not configured properly. See the **Action**'s description for details.

Notifications for this type of **Event** is hidden in system settings. See "Notifications" for more details.

Storage Failure

Occurs if **Media Server** is unable to write data on one or more **Storages**. This may be caused by the following:

- **Hard disk malfunction**.
- **Insufficient rights.** The permission to write on disk or recorded folder may be restricted by the computer Administrator.
- **Hard disk is too slow**: too many cameras are recorded and hard disk cannot record on such speed. It may be useful to add another hard disk drive.
- **Disk is full**. By default, **Media Server** writes data to disk in a circular pattern: as soon as free disk space falls below 5 Gb, oldest data will erase automatically. However, if the disk is full by any foreign data and free space is less than 5 Gb, **Media Server** writes data on disk and erases it immediately. In this particular case, the following **Event** occurs.

If no **Storages** are selected to write to, Storages are not Configured is fired up.

Basic Parameters

None

Advanced Parameters

Schedule (see "Setting up Schedule for Tracking Events").

Why Event may work incorrectly

Notifications for this type of **Event** is hidden in system settings. See "Notifications" for more details.

Network Issue

Occurs if network is unable to transfer data between **Camera** and **Media Server** and packet loss is detected. That may cause for frame rate to drop on **Camera**(s). If no frames are received from **Camera** for 10 seconds, **Camera** is considered offline. Camera Disconnection/Malfunction event is then generated in this particular case.

Basic Parameters

None

Advanced Parameters

Schedule (see "Setting up Schedule for Tracking Events").

Why Event may work incorrectly

Notifications for this type of **Event** is hidden in system settings. See "Notifications" for more details.

Camera IP Conflict

Occurs If another **Camera** with the same IP has entered the network, resulting in one of these two **Cameras** to go offline. Camera Disconnection/Malfunction event is then generated in this particular case.

Basic Parameters

None

Advanced Parameters

Schedule (see "Setting up Schedule for Tracking Events").

Why Event may work incorrectly

Notifications for this type of **Event** is hidden in system settings. See "Notifications" for more details.

Input Signal on Camera

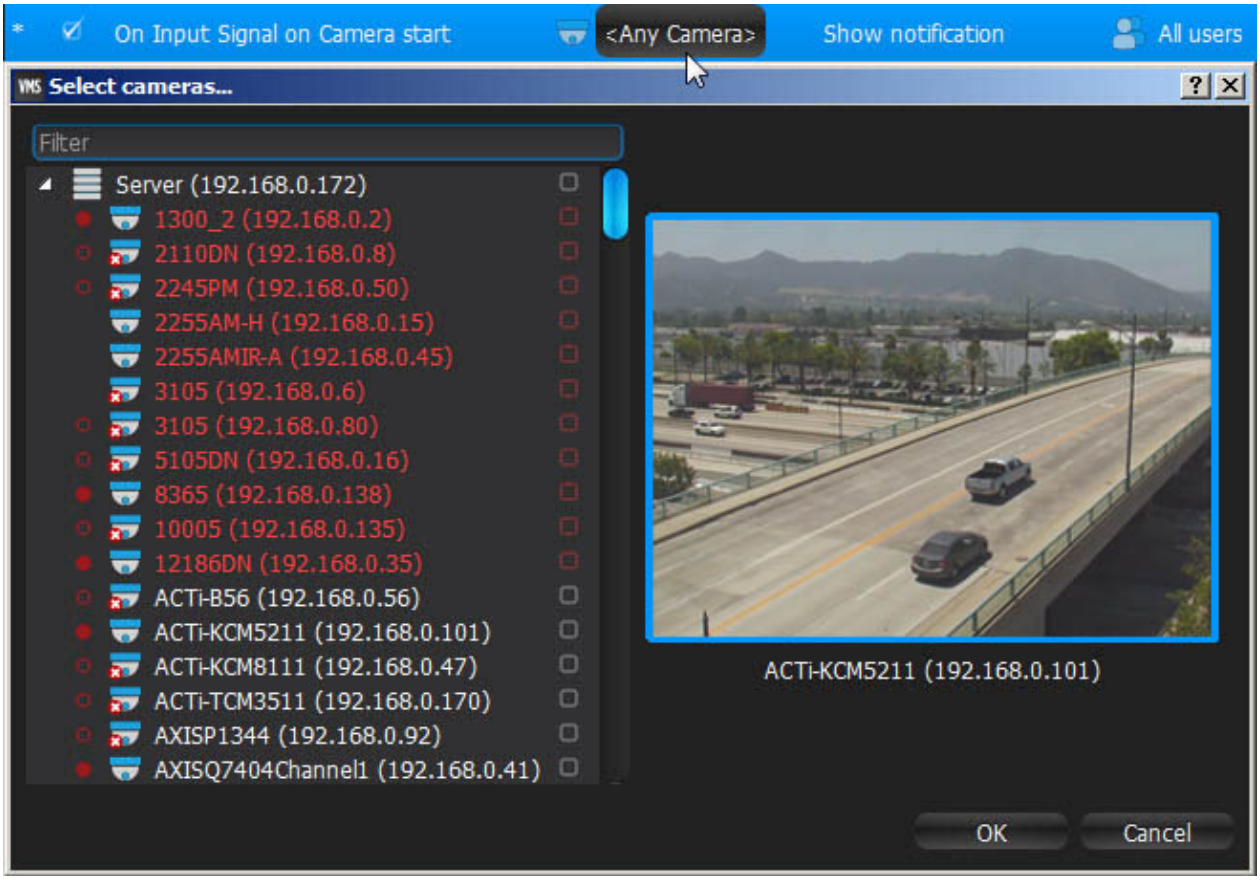
Occurs if input signal is detected on **Camera(s)**. Qulu may detect input signals on the following cameras:

- ONVIF-compliant (input support via ONVIF may vary from camera to camera)
- Axis.

Basic Parameters

Camera(s) the input signal is detected on. To specify:

1. Click on *Any Camera* at the desired row on the Alarm/Event Rules form. The following form will appear:



Note: Cameras that do not support input, are highlighted in red.

2. Check the cameras to detect input, then click *OK* (*Cancel* will discard changes).

To select all **Cameras** on a specific **Server**, click on the check box. To filter search, use the *Filter* box. Filter criteria are the same as search (see "Search"). It is possible to **Drag'n'Drop** the selected **Cameras** from Resource Tree onto the **Event**'s advanced settings form.

IMPORTANT. To detect input signals, input must be supported on **Camera**. If the selected **Camera** does not support input, then the corresponding message will be displayed (see above).

If do not specify the particular cameras, then input signal will be detected on all the cameras that support input.

Advanced Parameters

Schedule (see "Setting up Schedule for Tracking Events").

Starts/Stops. Available only for instant actions (Send Mail, Show Notification, Camera Output).

May result in

Camera Recording.

Panic Recording.

These actions will be performed while input signal is taking place on at least one camera out of the selected.

Send Mail.

Show Notification.

Camera Output.

These actions will be performed once input signal is detected on at least one camera out of the selected.

Why Event may work incorrectly

Motion is not supported on **Camera(s)** that is being monitored.

Too many **Cameras** are monitored and too many **Events** occur.

Cameras that are being monitored are offline.

Action is not configured properly. See the **Action**'s description for details.

Notifications for this type of **Event** is hidden in system settings. See "Notifications" for more details.

Media Server Failure

Occurs if **Media Server** is down (either hardware/software issue or manual shutdown). In this case, all hosted on **Media Server Cameras** are dropped offline.

Basic Parameters

None

Advanced Parameters

Schedule (see "Setting up Schedule for Tracking Events").

Why Event may work incorrectly

Notifications for this type of **Event** is hidden in system settings. See "Notifications" for more details.

Media Servers Conflict

Occurs if a new **Media Server** is connected to another **Enterprise Controller** on the same network and pulls data from same **Cameras**. In this case, some **Cameras** may drop offline because they may not provide several streams simultaneously. This results in Camera Disconnection/Malfunction **Event**.

Basic Parameters

None

Advanced Parameters

Schedule (see "Setting up Schedule for Tracking Events").

Why Event may work incorrectly

Notifications for this type of **Event** is hidden in system settings. See "Notifications" for more details.

EC Connection Lost

Occurs if connection to **Enterprise Controller** is lost for whatever reason (network issue or EC is down). In this case, the connection icon in the top right corner becomes red ( ) and Notification is displayed.

If **User** clicks on the notification, then login dialog will automatically open. See "Connecting to Enterprise Controller and Working Offline".

This notification will hide automatically as soon as the connection is restored.

Why Event may work incorrectly

Notifications for this type of **Event** is hidden in system settings. See "Notifications" for more details.

Licenses are not Configured

Occurs if no Licenses are activated. In this case, Notification is displayed.

In this case, it is not possible to record **Cameras** and view **Analog Cameras**.

If **User** clicks on the notification, then license dialog will automatically open. See "Obtaining and Activating Qulu Licenses".

This notification will hide automatically as soon as one **License** is activated.

Why Event may work incorrectly

Notifications for this type of **Event** is hidden in system settings. See "Notifications" for more details.

E-mail is not Set for Users

Occurs if E-Mail address is not set up:

- **Viewer** is notified if an email address is not configured.
- **Administrator** is notified if a **User** does not have an email address specified.

In this case, Notification will be displayed.

If click on the notification, **User's** mail settings dialog will open. See "Changing User Settings".

If **User** does not have an e-mail address, that user is unable to receive mail notifications.

This notification will hide automatically as soon as all email addresses are configured (for Admin) or individual email address is set (Viewer).

Mail Notifications may not work if E-Mail Server is not configured. In this case, Error while Sending E-Mail notification will appear.

Why Event may work incorrectly

Notifications for this type of **Event** is hidden in system settings. See "Notifications" for more details.

E-Mail Server is not Configured

Occurs if E-Mail Server is not configured. In this case, Notification is displayed.

If E-Mail Server is not configured, mail notifications cannot not be sent.

If click on the notification, Mail Server settings dialog will open. See "Mail Notifications" for details.

This notification will hide automatically as soon as all E-Mail Server parameters are configured.

Mail Notifications may not work if E-mail is not Set for Users. In this case, Error while Sending E-Mail notification will appear.

Why Event may work incorrectly

Notifications for this type of **Event** is hidden in system settings. See "Notifications" for more details.

Error while Sending E-Mail

Occurs when E-Mail Notification fails. In this case, Notification is displayed.

If click on the notification, Mail Server settings dialog will open. See "Mail Notifications" for details.

Storages are not Configured

Occurs if no **Storages** are selected (recording flag might have been removed accidentally).

In this case, Notification is displayed.

If **Storages** are not configured, it is not possible to record **Cameras**.

If click on the notification, storage configuration dialog will open. See "Configuring Media Server Storages (Admin Only)".

This notification will hide automatically once **Storage** has a recording flag set up.

Why Event may work incorrectly

Notifications for this type of **Event** is hidden in system settings. See "Notifications" for more details.

Media Server Started

Occurs when any Media Server registered in the system has started.

Basic Parameters

None

Advanced Parameters

Schedule (see "Setting up Schedule for Tracking Events").

Why Event may work incorrectly

Notifications for this type of **Event** are hidden in system settings. See "Notifications" for more details.

Actions that Qulu Can Do

Qulu reacts differently to each **Event**. The result is called **Action**. Each **Action** that is fired up by the software may have its own parameters. Refer to the particular **Action** description for more information:

- Notifications
- Visual Motion Indication
- Mail Notifications
- Start Recording on Camera
- Start Panic Recording
- Trigger Camera Output
- Play Sound
- Repeat Sound
- Speak
- Write to Log.

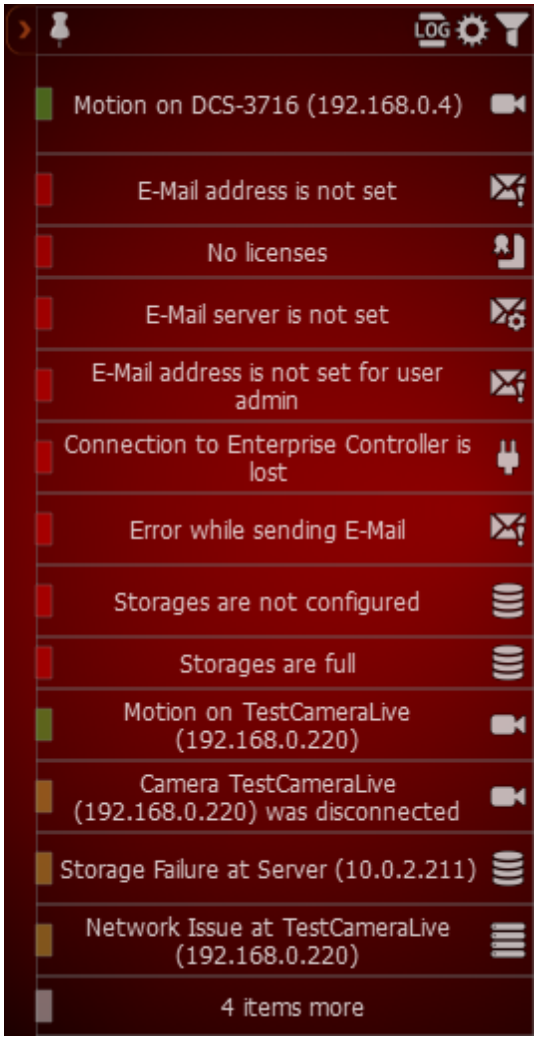
See "Tracked Events" for detailed information on **Events**.

Notifications

Qulu provides a powerful notification mechanism for notifying **Users** of **Events** that occur. When **Event** occurs, right Panel starts blinking (the color varies depending on the importance of the notification). Notification Types:

- **System Messages** (red) – something is not properly configured. Can be fixed.
- **Warnings** () – critical event (Camera disconnected, Media Server failure, etc).
- **Notifications** – non-critical events (motion, input signal, etc).

If a user opens the panel, the following will be displayed (on the right):


LOG
Motion on DCS-3716 (192.168.0.4)
E-Mail address is not set
No licenses
E-Mail server is not set
E-Mail address is not set for user admin
Connection to Enterprise Controller is lost
Error while sending E-Mail
Storages are not configured
Storages are full
Motion on TestCameraLive (192.168.0.220)
Camera TestCameraLive (192.168.0.220) was disconnected
Storage Failure at Server (10.0.2.211)
Network Issue at TestCameraLive (192.168.0.220)
4 items more

It is possible to perform the following:

- **Obtain additional information** by hovering over the notification with a mouse cursor. The information will appear on the left:

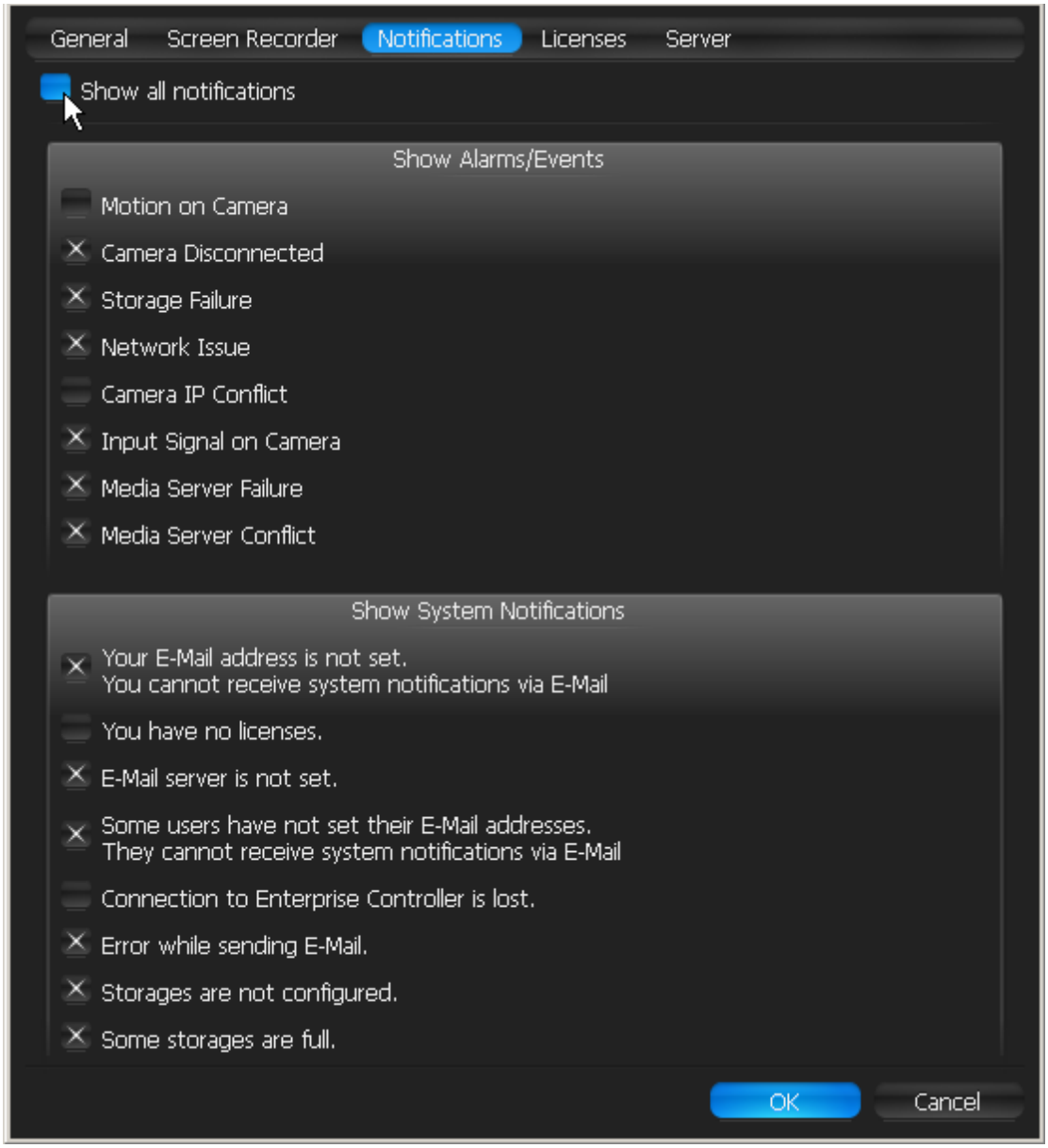
Event: Input Signal on Camera
Source: AXISM1031W (192.168.1.155)
First occurence: 22:59:39 on Tue Aug 6 2013 (4 times total)
Input port: 01
Network Issue at AXISM1031W (192.168.1.155)
Camera IP Conflict at Server (192.168.1.149)
Input on AXISM1031W (192.168.1.155)
Media Server "Server (192.168.1.149)" Failure
Media Server "Server (192.168.1.149)" Conflict

  - Motion Detection and Input Signals – the frame from **Camera** the **Event** occurred at and additional information. Click on the notification or additional information to open **Camera** to view its archive for event specifics.
  - Network Issue on Camera – the last frame received from **Camera** and additional information. Click on the notification or additional information to open Camera Settings.
  - Issues related to System Messages – additional information. Click on the notification to go to the appropriate dialog.

  When clicking on notification or detailed information, the corresponding action will be performed:

  - **Motion or Input on Camera** – **Camera** will be opened in a new Tab.
  - **Camera IP Conflict** – **Camera**'s Web Page will be opened in a browser
  - **Camera Network Issue** – **Camera**'s Settings form will be opened
  - **Media Server Failure or Storage Issue** – Server Settings form will be opened
  - **E-Mail Issue** – E-Mail Server Settings form will be opened
  - **License Issue** – License Form will be opened
  - **Connection is Lost** – connection dialog will be opened
  - **Media Server Conflict** – no action
- **Close the notification**. Either **Right Click** or hover over with a mouse cursor to obtain additional information and click on the cross sign in the top right corner. Green and yellow notifications will eventually disappear.
- **View** Event Log. Click on LOG.
- **Go to** Event Settings. Click on .

- **Show/Hide notifications of this particular type**. Click on or Open Main Menu and go to *System Settings –> Notifications*:



Select notifications types that should be displayed. Click *Apply* or *OK* when finished. To discard changes, click *Cancel*.

Basic Parameters

Type of **Users** notifications are displayed to:

- All users
- Administrators only.

Advanced Parameters

Aggregation Period

May be caused by

All **Events**.

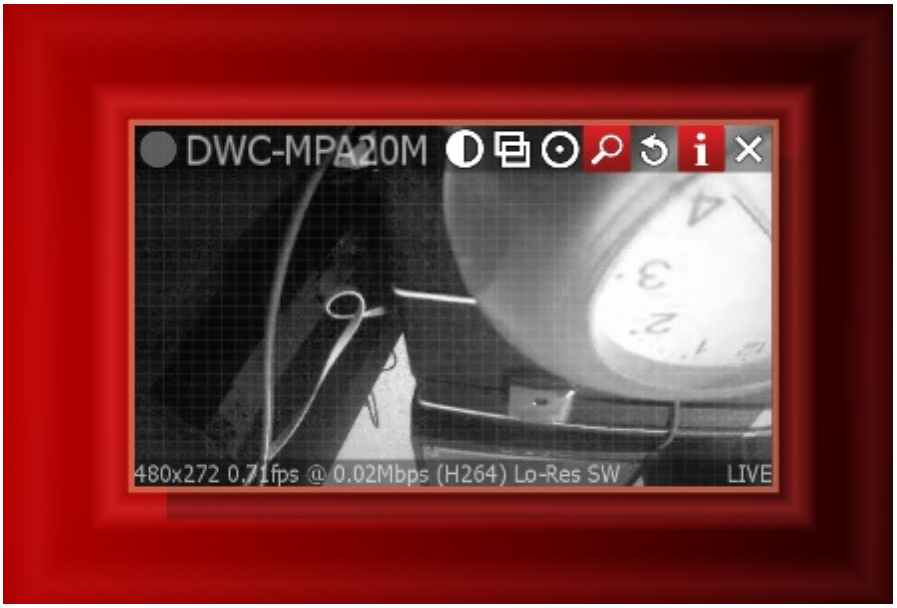
Why Action may work incorrectly

Some notifications are disabled.

Event is not configured properly. See **Event** description for details.

Visual Event Indication

If too many Cameras are opened at the same time, it becomes very difficult to locate a specific Camera when Event occurs. Qulu provides a powerful and intuitive way to highlight a specific object on Scene if **Event** occurs:



The following **Events** are indicated:

- Motion on Camera Network Issue and Input Signal on Camera – visualization on **Camera**
- Server Issue – visualization on **Media Server Monitoring Widget** if Media Server is being monitored (see "Monitoring Media Servers (Admin Only)").

The action is always enabled and does not require configuration.

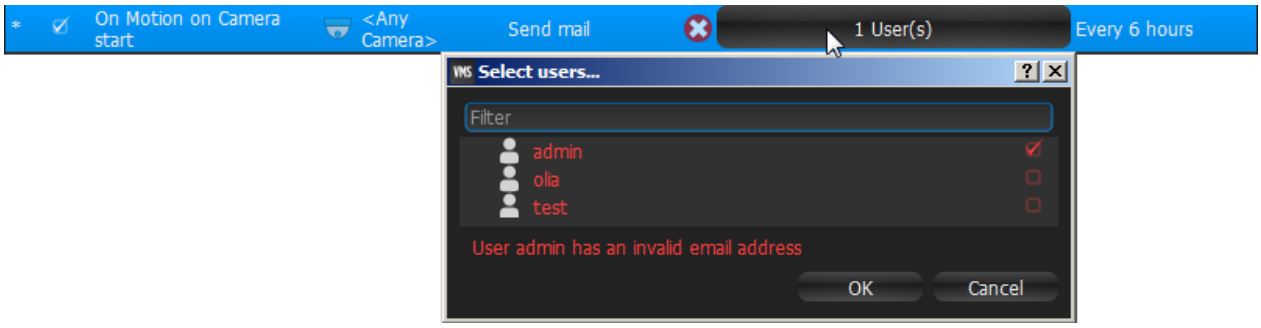
Mail Notifications

Qulu can send E-mails to **Users** or to additional addresses when **Events** occur.

IMPORTANT. E-Mails cannot be sent if **E-Mail Server** is not configured. In this case, E-Mail Server is not Configured notification is shown up. See "Configuring Mail Server for E-Mail Notifications" for more details.

Basic Parameters

Users the E-Mails should be sent to:

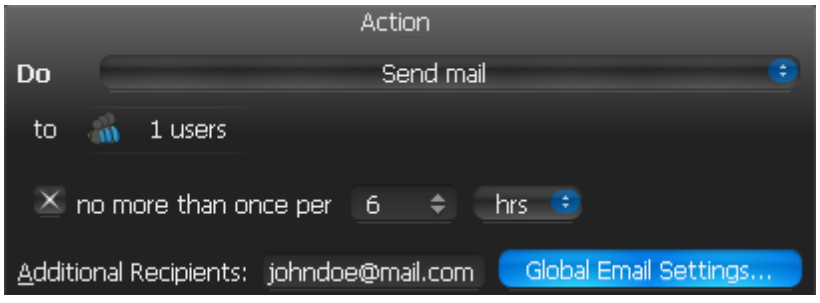


To filter search, use the *Filter* box. Filter criteria is the same as search (see "Search"). It is possible to Drag'n'Drop selected **Users** from Resource Tree onto **Action**'s advanced settings form.

IMPORTANT. E-Mails will be sent to **Users**' E-Mail addresses. If E-Mail address is not configured for **User**, then the user cannot receive E-Mails (see above). E-mail is not Set for Users notification is generated in this case. See "Changing User Settings" for information on how to set up E-Mail for **User**.

Note: To send E-Mails to additional addresses, see advanced parameters.

Advanced Parameters

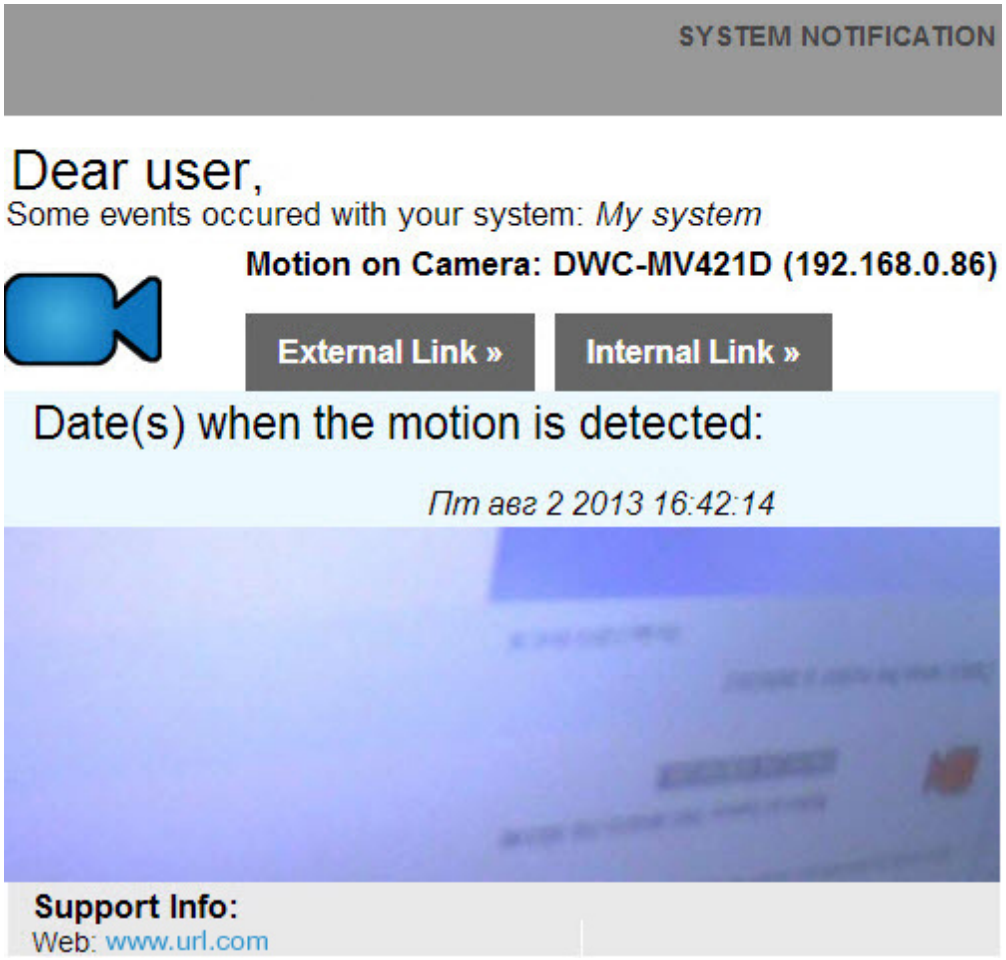


Additional Recipients – additional E-Mail addresses to send notifications to. Several recipients must be separated by the ";" symbol.

Aggregation.

Note: Click on *Global Email Settings* to configure E-Mail Server parameters.

As soon as event occurs, a mail notification is sent as follows:



E-Mail message about motion on **Camera** containing the link that opens Web-Client, starts playing the camera at this particular moment.

May be caused by

All **Events**.

Why Action may work incorrectly

E-Mail Server is not configured. In this case, E-Mail Server is not Configured notification will appear. See "Configuring Mail Server for E-Mail Notifications" for more details.

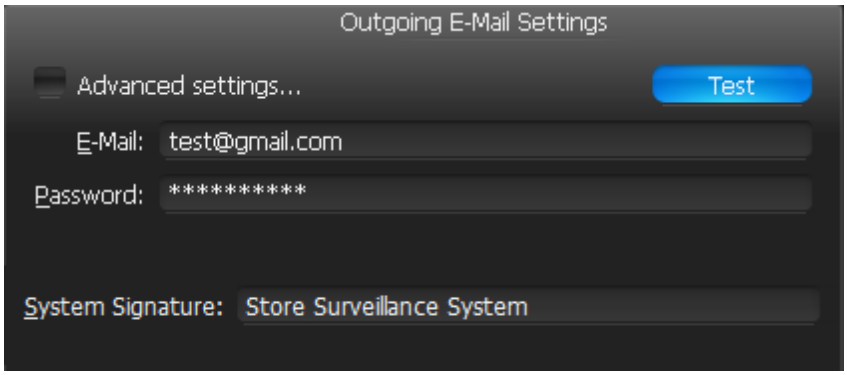
Event is not configured properly. See **Event** description for details.

Configuring Mail Server for E-Mail Notifications

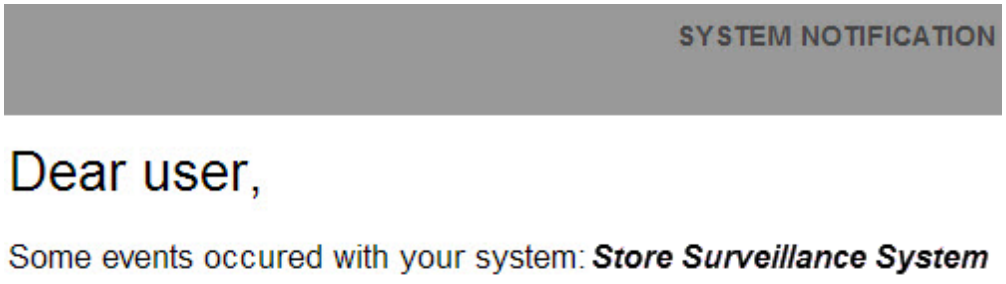
In order to send Mail Notifications on **Events**, E-Mail Server should be configured. To configure E-Mail Server:

1. Choose from one of the following:
   - Open Main Menu and go to *System Settings –> Server*
   - Open advanced parameters of any Email notification on Alarm/Events Rules form and click *Global Email Settings...*
2. Choose quick or advanced E-Mail Server setup (see below for reference).
3. When finished, press *OK* to apply or *Cancel* to discard settings.

Quick E-Mail Server Setup

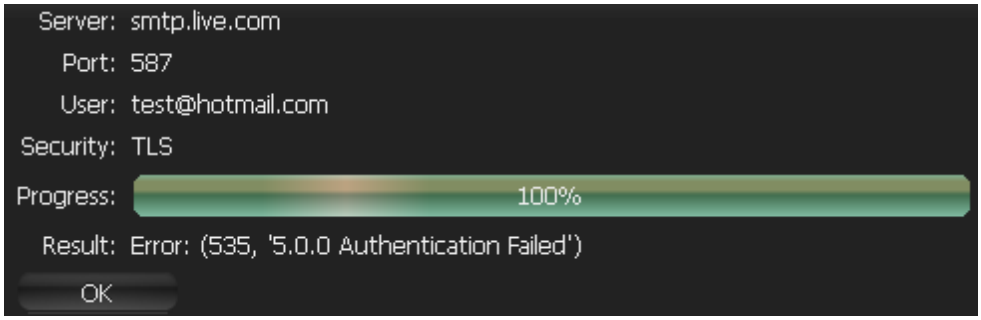


- *E-Mail/Password* – address and password of the mail account, which will be used for outgoing mail. Qulu will handle the rest.
- *System Signature* – name of the Qulu installation. Will appear as follows:

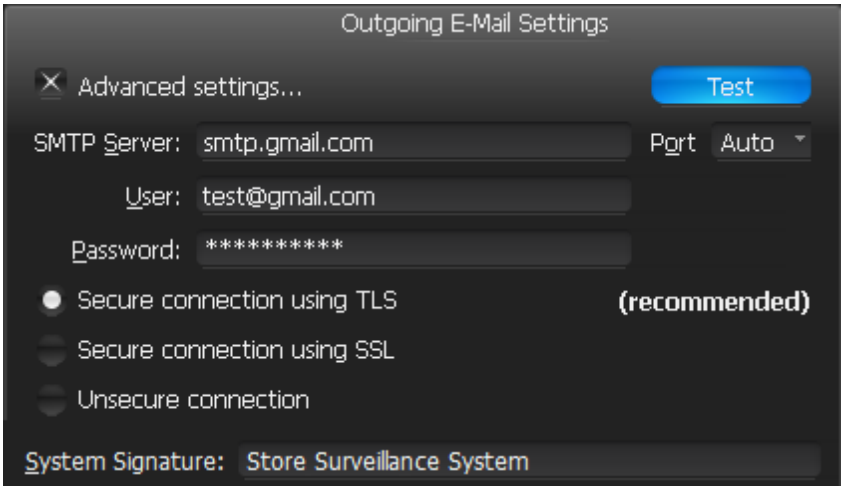


Note: click *Test* to ensure that the settings are correct. If test fails:

- If the result is "Cannot test such parameters", the domain name is not supported. It is necessary to switch to Advanced mode and set up the server manually.
- If the result is different, the error message will be displayed:



Advanced E-Mail Server Setup



The parameters are the same as in **Simple Setup** plus:

- *SMTP Server*: E-Mail server address
- *Port* – SMTP Port
- Connection type: (Secure (TLS), Secure (SSL), Unsecure).

Note: click *Test* to ensure that the settings are correct. If test fails:

- Try a different SMTP Port
- Try a different connection type.

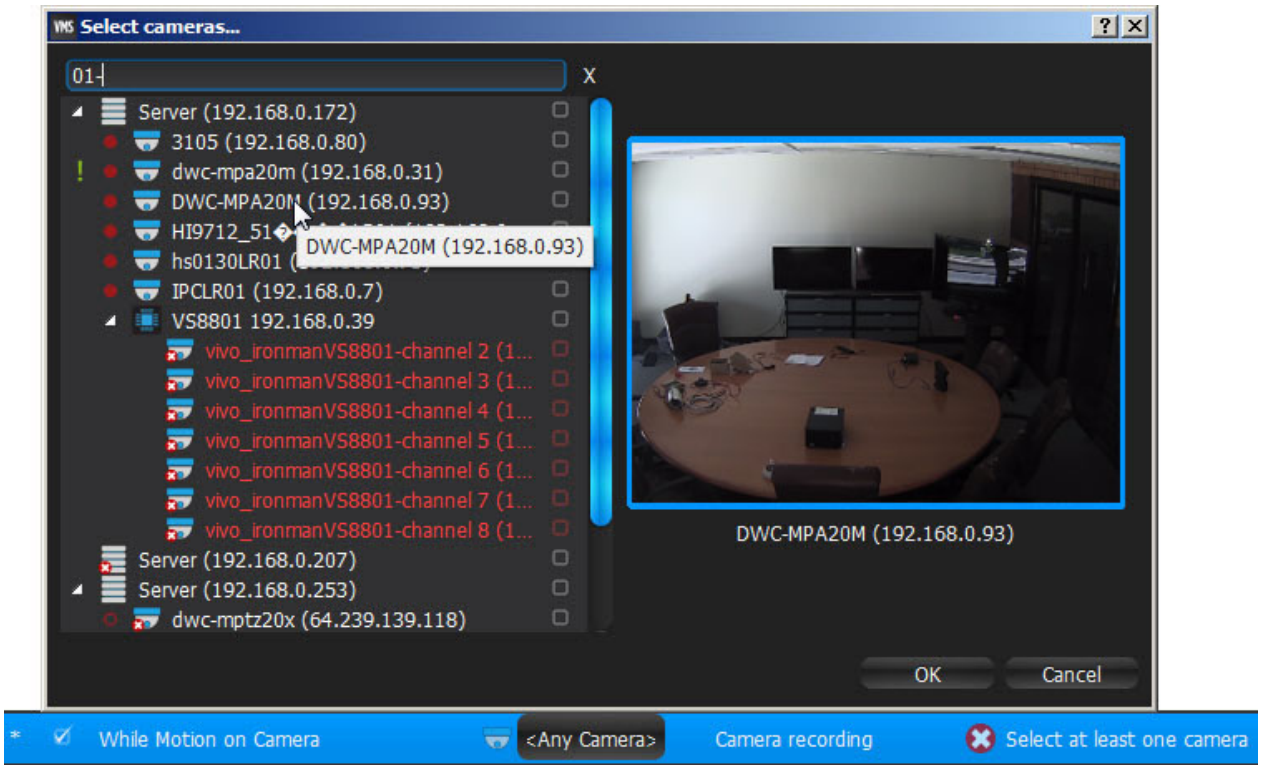
Start Recording on Camera

Starts recording on **Camera**(s) when **Event** occurs. For instance, if Motion is detected on Cameras 1, 2 or 4, recording on Cameras 4, 5 and 6 will start.

Basic Parameters

Camera(s) to record. To specify:

1. Click on *Select at least one camera* in the desired row on the Alarm/Event Rules form. The following form will appear:

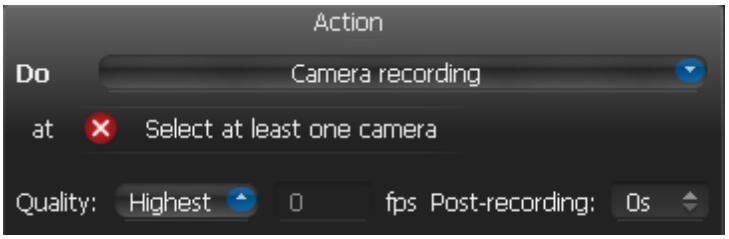


2. Check the cameras to record, then click *OK* (*Cancel* will discard changes).

To select all **Cameras** on a specific **Server**, check the corresponding box. To filter search, use the *Filter* box. Filter criteria is the same as search (see "Search"). It is possible to **Drag'n'Drop** the selected **Cameras** from Resource Tree onto the **Action**'s advanced settings form.

IMPORTANT. To record **Camera** on **Event**, recording must **be enabled** on **Camera**. Refer to "Modifying Recording Schedule" for information on how to enable recording. If the "Recording" flag is not set on the selected **Camera**, the following message will be displayed (see above).

Advanced Parameters



Quality and *fps* – target recording parameters for **Camera**(s). If **Camera**'s maximum FPS is lower than specified, maximum FPS will be acquired.

Post-recording – the time it takes for the recording to be performed after the event is f complete.

May be caused by

Motion on Camera

Input Signal on Camera.

Why Action may work incorrectly

Recording is not enabled on **Camera**. Refer to "Modifying Recording Schedule" for information on how to enable recording.

Event is not configured properly. See the **Event** description for details.

Start Panic Recording

Starts **Panic Recording** when **Event** occurs.

Panic Recording mode switches **Recording Settings** for all **Cameras** to **maximum FPS and Quality**.

Note: if Recording is **not enabled** for **Camera**, **Panic Recording will not be activated.**

Current **Panic Recording** status can be viewed:

- in Recording Schedule (see "Modifying Recording Schedule")
- in server's settings (see "Obtaining and Configuring Media Server's Additional Settings (Admin Only)").

Basic Parameters

None.

Advanced Parameters

None.

May be caused by

Motion on Camera

Input Signal on Camera.

Why Action may work incorrectly

Event is not configured properly. See **Event** description for details.

Trigger Camera Output

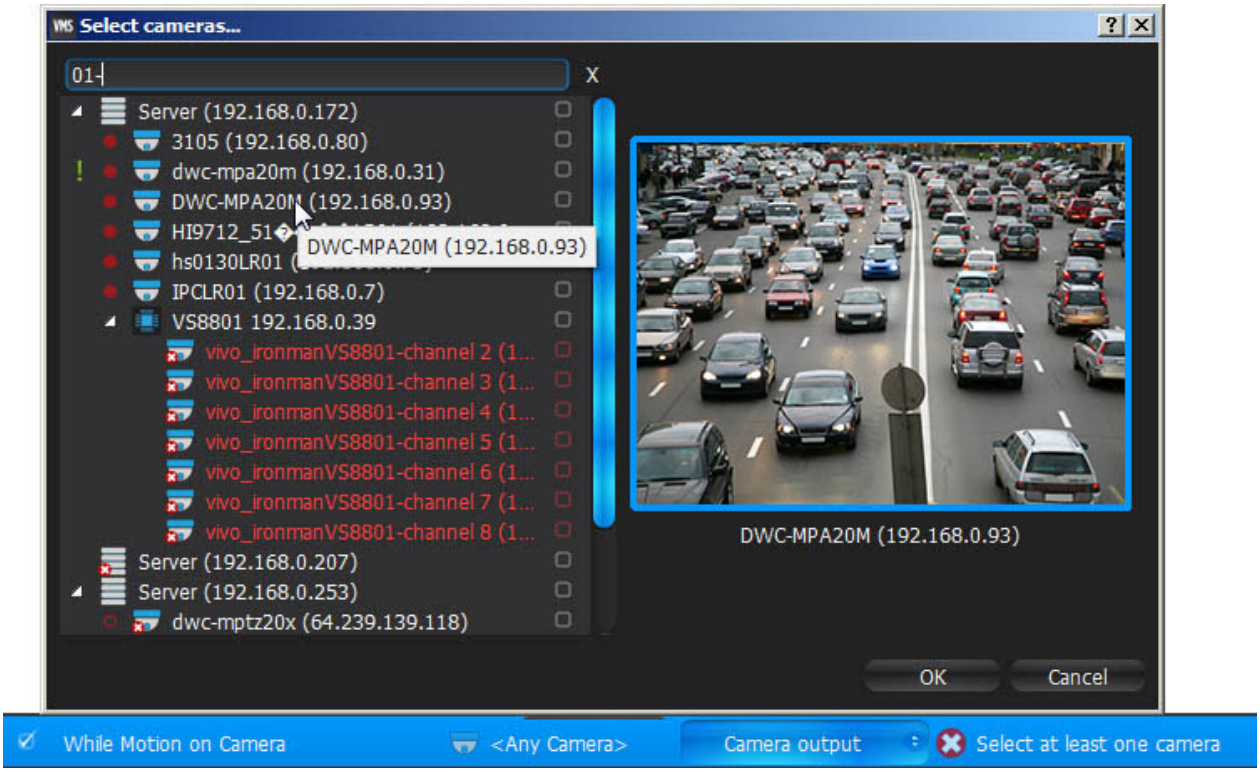
It is possible to generate output via two different methods:

- **Output** – generates output on **Camera**(s) while **Event** occurs and stops when Event ends.
- **Camera output for 30 seconds** – generates output on **Camera**(s) when **Event** occurs and stops output in 30 seconds.

Basic Parameters

Camera(s) output is triggered on. To specify:

1. Click on *Select at least one camera* in the desired row on the Alarm/Event Rules form. The following form will appear:

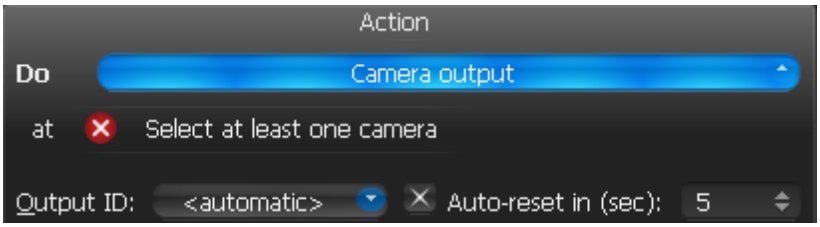


2. Check the cameras to trigger output, then click *OK* (*Cancel* will discard changes).

To select all **Cameras** on a specific **Server**, check the corresponding box. To filter search, use the *Filter* box. Filter criteria is the same as search (see "Search"). It is possible to **Drag'n'Drop** the selected **Cameras** from Resource Tree onto the **Action**'s advanced settings form.

IMPORTANT. To trigger output signals, output must be supported on **Camera**. If the selected **Camera** does not support output, then the corresponding message will be displayed (see above).

Advanced Parameters



Output ID – reserved for multi-channel recorder support.

Auto-reset in (sec) – if checked, the output will be reset automatically after the specified period of time.

Aggregation Period (for **Camera output for 30 seconds**)

May be caused by

Any events – Camera output for 30 seconds.

Motion on Camera and Input Signal on Camera – synchronous output. Output stops when motion or input are stopped.

Why Action may work incorrectly

Output is not supported on some **Cameras**.

Output and **Camera output for 30 seconds** are slightly different.

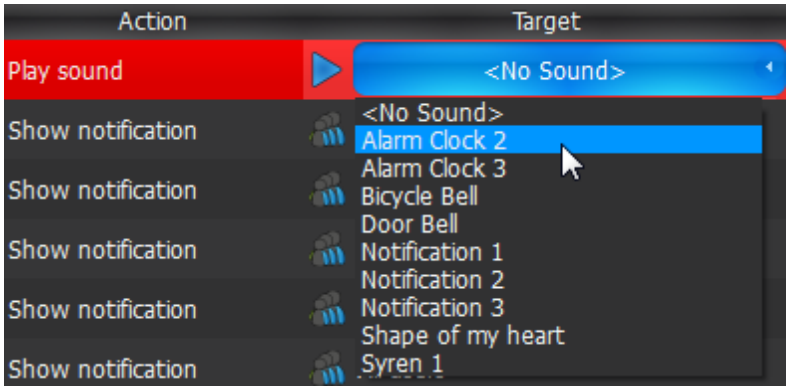
Event is not configured properly. See **Event** description for details.

Play Sound

Plays the specific sound when **Event** occurs.

Basic Parameters

Sound to be played. It is possible to select any sound from the available options:



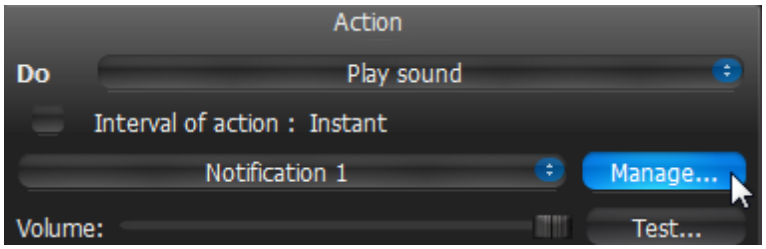
Advanced Parameters

Volume

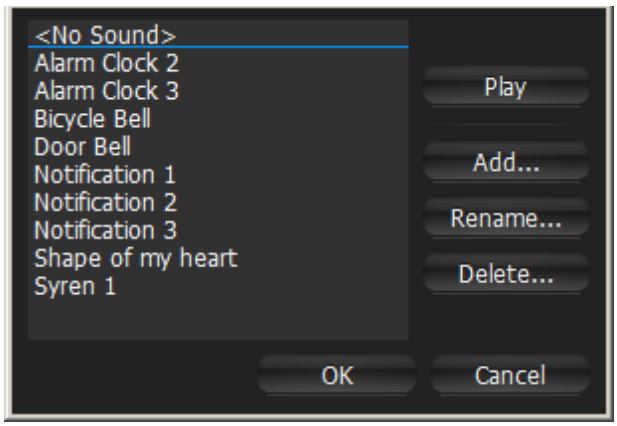
Aggregation

Sound library customization: adding, editing or removing sounds.

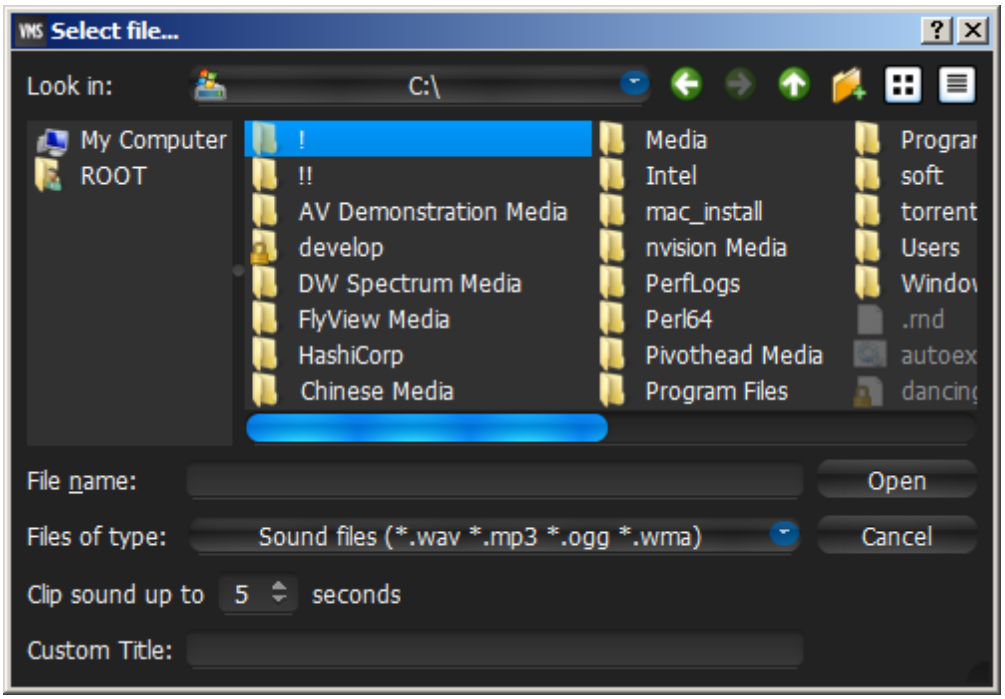
To view the sound library, go to **Advanced Parameters** and click *Manage...*



The following dialog will appear:



- To **add** sound:
  1. Click *Add...* and select the desired audio file.



  2. Choose the duration and set it to *Clip sound up to*. The audio file will be cut to the specified duration.
  3. Choose *Custom Title* for the selected sound. If not specified, the file name will be used as the title by default.
  4. Click *Open* to add the sound or *Cancel* to discard changes.
- To **rename** the selected sound, click *Rename...* and enter a new title
- To **test** the chosen sample, click *Play...*
- To **delete** the selected sample, click *Delete...*
- Click *Open* to add the sound or *Cancel* to discard changes.

May be caused by

All **Events**.

Why Action may work incorrectly

Event is not configured properly. See **Event** description for details.

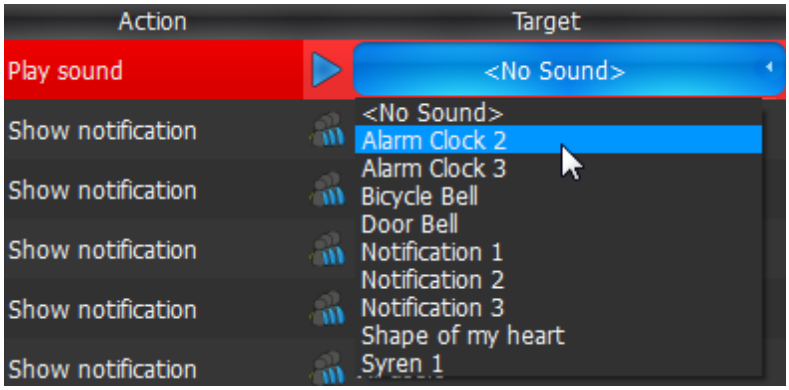
Sound is muted. Open any item on Scene and check if the sound is muted. Volume settings are applied globally. See "Adjusting Volume".

Repeat Sound

Plays a specific sound while **Event** occurs.

Basic Parameters

Sound to be played. It is possible to select any sound from the available options:

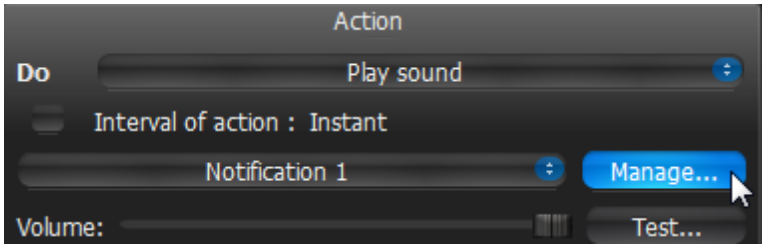


Advanced Parameters

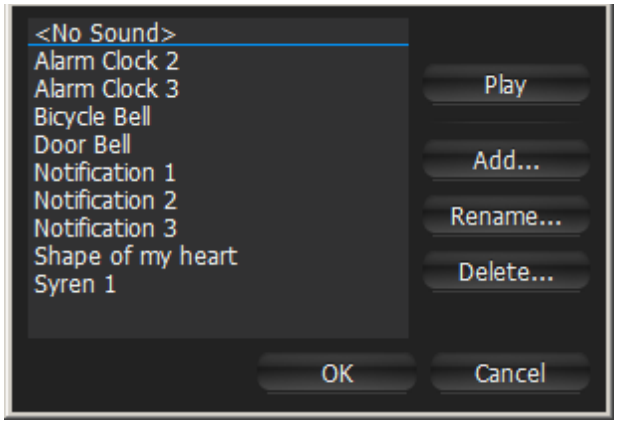
Volume

Sound library customization: adding, editing or removing sounds.

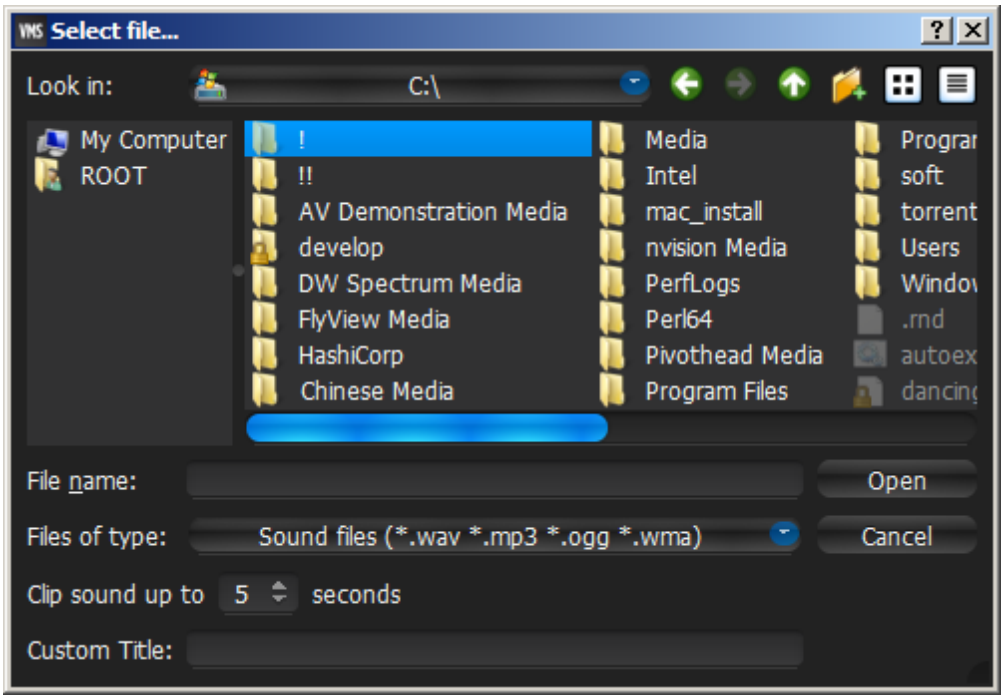
To go to sound library go to **Advanced Parameters** and click *Manage...*



The following dialog is displayed



- To **add** a sound:
  1. Click *Add...* and select the desired audio file.



  2. Choose the duration and set it to *Clip sound up to*. The audio file will be cut to the specified duration.
  3. Choose *Custom Title* for the selected sound. If not specified, the file name will be used as the title by default.
  4. Click *Open* to add the sound or *Cancel* to discard changes.
- To **rename** the selected sound, click *Rename...* and enter a new title
- To **test** the chosen sample, click *Play...*
- To **delete** the selected sample, click *Delete...*
- Click *Open* to add the selected sound or *Cancel* to discard changes.

May be caused by

Motion on Camera

Input Signal on Camera.

Why Action may work incorrectly

Event is not configured properly. See **Event** description for details.

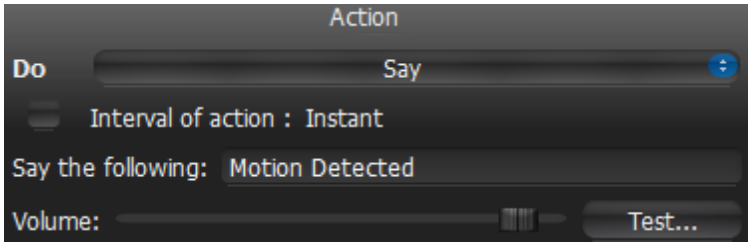
Sound is muted. Open any item on Scene and check if the sound is muted. Volume settings are applied globally. See "Adjusting Volume".

Say Text

Pronounces specific text when **Event** occurs.

Basic Parameters

Text to pronounce:



Advanced Parameters

Aggregation

May be caused by

All **Events**.

Why Action may work incorrectly

Event is not configured properly. See **Event** description for details.

Sound is muted. Open any item on Scene and check if the sound is muted. Volume settings are applied globally. See "Adjusting Volume".

Write to Log

Writes the record to **Log** when **Event** occurs.

By default, all **Events** mentioned in **Rules** are written to **Log**. However, in some cases it may be necessary to disable all notifications but certain types of **Events** in **Log**. In this instance, create **Rule** with this particular type of **Action**.

Basic Parameters

None

Advanced Parameters

Aggregation

May be caused by

All **Events**.

Why Action may work incorrectly

Event is not configured properly. See **Event** description for details.

Default Rules

As soon as Qulu is installed, default **Rules** are set up.

The following **Events**

- Camera Disconnection/Malfunction
- Storage Failure
- Network Issue
- Camera IP Conflict
- Media Server Failure
- Media Servers Conflict

will result in

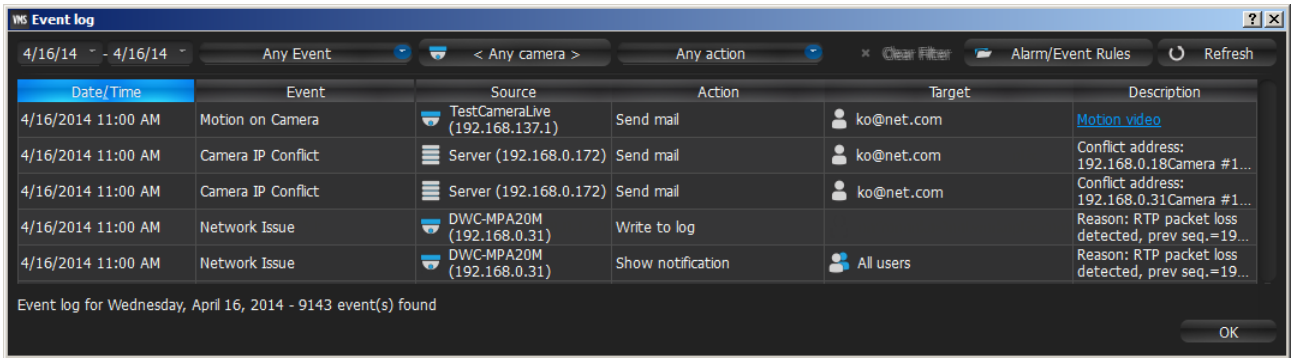
- Notifications to all **Users** (no more than once per 30 seconds).
- Mail Notifications for admin. To receive mail notifications, E-Mail Server must be configured (see "Configuring Mail Server for E-Mail Notifications") with e-mail address specified for admin (see "Changing User Settings").
- Write to Log.

Viewing Events Log

Each event that occurs in Qulu is stored in **Event Log**. **Event Log** makes it easy to navigate through past activity or diagnose **Camera** or **Server**. To view the log, proceed with one of the following:

- Open Main Menu and go to *Event Log* (***Ctrl + L***)
- Open Notification Panel on the right and click LOG.
- To view **Events** that occurred on a particular **Camera**: open Camera's Context Menu and choose *Check Camera Issues...*

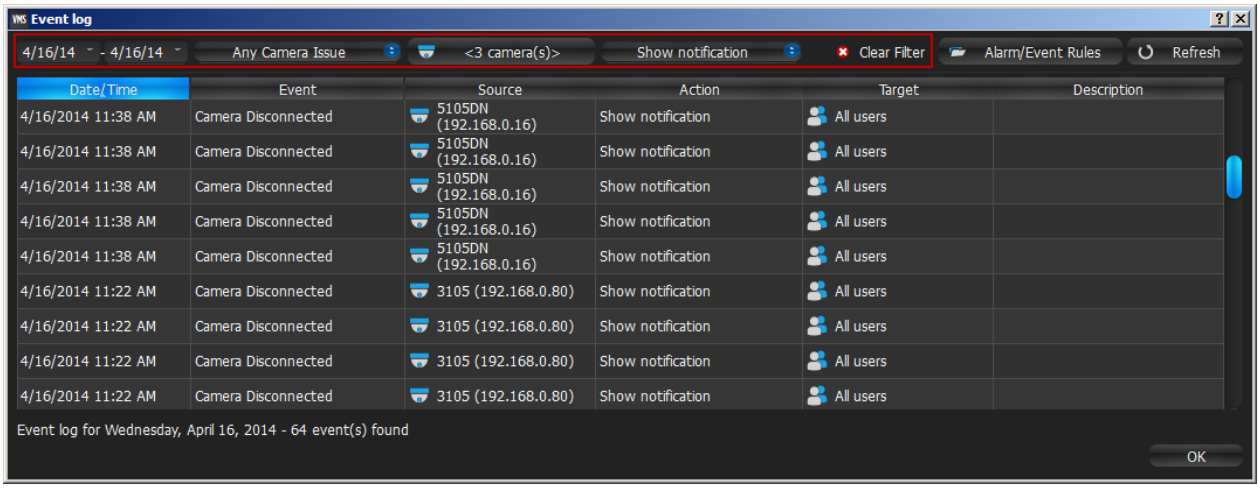
The data is broken down by the following columns:



- *Date/Time* – date and time the event occurred
- *Event* – the name of the event
- *Source* – the resource that initiates the event: Camera (Motion Detection, Input Signal, etc) or Server (Storage Failure, Server Failure, etc).
- *The Action* that is performed when **Event** occurs.
- *Target* – the recipient of the action: **Users** or **Cameras**.
- *Description* – any additional information. If Motion is detected, then hyperlink is provided. When clicking on hyperlink, the Camera will open in a new Layout and start playing back from the moment Motion occurred.

The following tools are available to manage **Camera List**:

- **Sort** data by column. **Left Click** on column's header.
- **Filter** data. Select filter conditions on the top:


Event log
4/16/14 - 4/16/14
Any Camera Issue
<3 camera(s)>
Show notification
Clear Filter
Alarm/Event Rules
Refresh
Date/Time
Event
Source
Action
Target
Description
4/16/2014 11:38 AM Camera Disconnected 5105DN (192.168.0.16) Show notification All users
4/16/2014 11:38 AM Camera Disconnected 5105DN (192.168.0.16) Show notification All users
4/16/2014 11:38 AM Camera Disconnected 5105DN (192.168.0.16) Show notification All users
4/16/2014 11:38 AM Camera Disconnected 5105DN (192.168.0.16) Show notification All users
4/16/2014 11:38 AM Camera Disconnected 5105DN (192.168.0.16) Show notification All users
4/16/2014 11:22 AM Camera Disconnected 3105 (192.168.0.80) Show notification All users
4/16/2014 11:22 AM Camera Disconnected 3105 (192.168.0.80) Show notification All users
4/16/2014 11:22 AM Camera Disconnected 3105 (192.168.0.80) Show notification All users
4/16/2014 11:22 AM Camera Disconnected 3105 (192.168.0.80) Show notification All users
Event log for Wednesday, April 16, 2014 - 64 event(s) found
OK

  - **Start** and **End Date** – only the events that occurred during a particular period of time are displayed (the current day by default)
  - **Event type** – displays a specific type of events only
  - **Camera** – displays events on a particular camera only (applies to Motion, Input and Camera Issues)
  - **Action type** – specific events caused by certain types of actions are displayed

  To remove all filter conditions, click *Clear Filter* or open Context Menu and select *Clear Filter.*

  To show events that are related to a particular source, locate the actual event, open Context Menu and select *Filter Similar Rows.*
- **Select multiple rows** from a table. Drag the mouse, use ***CTRL + Click/Up/Down*** arrows, or ***Shift + Click/ Up/Down*** arrows. Use ***CTRL + A*** to select all records.
- All **Camera** options (open, rename, diagnose, etc.). To access the cameras, Select **Camera** and open Context Menu.
- All **Media Server** options (monitor, configure, diagnose, etc.). To access Media Servers, Select **Media Server** and open Context Menu.
- **Export** data from one or multiple rows to an external file. Select the desired rows, open Context Menu and select *Export Selected to File...* Choose a file name and format. The following formats are supported:
  - HTML File
  - CSV file (text file with delimiters). This file type can easily be imported into Microsoft Excel.
- **Copy one or several rows** to clipboard. Select the desired rows, open Context Menu and select *Copy Selection to Clipboard*. The data can be pasted into any text editor or Microsoft Excel.

It is possible to view the event log on a specific **Camera** or **Media Server**.

- Camera: open Camera's Context Menu (on Scene, in Resource Tree, etc.) and select *Check Camera Issues...*
- Server Diagnostics: open Server's Context Menu (on Scene, in Resource Tree, etc.) and select *Server Diagnostics*...

Event Log will open and a filter will apply (Source - desired **Camera** or **Media Server**).

User Management

Qulu provides a simple way to manage **Users**: there are only three roles in the System: **Super Administrators**, **Administrators** and **Viewers** (can be configured as **Live Viewer**, **Viewer**, **Advanced Viewer**). See "Introducing User Roles" for details.

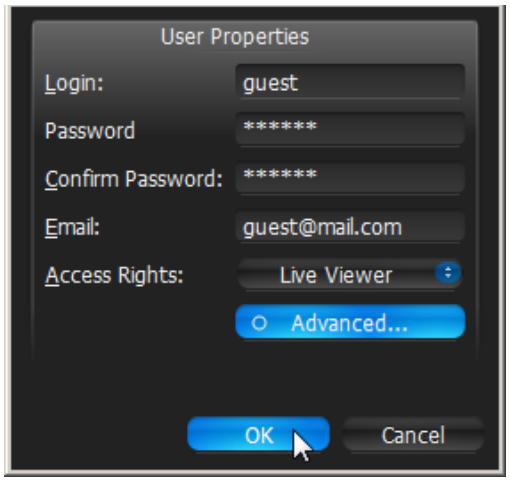
The following options are provided for users management:

- Creating New User (Admin Only)
- Changing User Settings
- Deleting User (Admin Only).

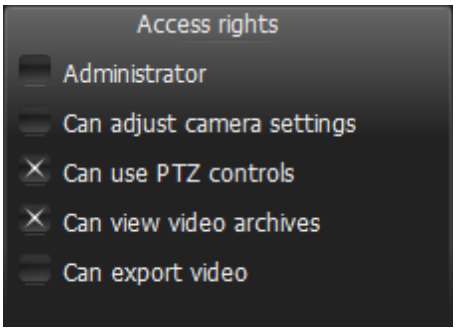
Creating New User (Admin Only)

To create **User**:

1. Do one of the following:
   - Open Main Menu and go to *New –> User*
   - **Right-Click** on *Users* in Resources Tree and choose *New*.
2. Enter user settings:
   - *Login* and *Password* – user credentials. **IMPORTANT:** login and password are **case sensitive**.
   - *Email* – this address will be used for E-Mail notifications. If it is not set the user will not be able to receive such notifications. See "Mail Notifications".
   - *Access Rights* – Administrator or Viewer. See "Introducing User Roles" for more details.



By default **Viewer** can only view live video. To setup additional permissions, click *Advanced*. The following **Permissions** can be assigned:



3. Click OK to create a user.

Once **User** is established, **Layouts** can be created and assigned to this **User**. See "Creating New Layout".

Changing User Settings

The following **User Settings** can be modified:

- **Login** (Admin only) – can be changed for all users except **Super Administrator** (admin). Also, a user cannot change own login name. The login name can be set in Resource Tree.
- **Password** – can be changed for all users, except **Super Administrator** (`admin`). **Viewer** can only change own password. **Super Administrator** can change his password as well.
- **E-Mail**.
- **Role** and **Permissions** (Admin only) – can be changed for all users, except **Super Administrator** (`admin`). Also, **User** cannot change own role.

To change **User Details**:

1. Select any **User** in Resource Tree, **Right-Click** on Context Menu and choose *User Settings*.
2. Change the desired fields and click *OK* (or *Cancel* to close the form).

Deleting User (Admin Only)

It is possible to delete any **User**, except **Super Administrator**. A **User** cannot delete own profile. To delete, locate the desired **User** in Resource Tree, **Right-Click** for Context Menu and choose *Delete* (or press ***DEL***).

IMPORTANT. All associated **Layouts** will automatically be deleted along with the **User**.

Layout Management

Layouts are a powerful and flexible way to represent video data in Qulu. **Layout** can contain an unlimited number of videos: **Cameras**, **Local videos** or **Images**, which are not restricted in terms of location, size or orientation.

Initially, **Layout** is created and configured by **Administrator**. It can then be assigned to **Viewers**. Viewers can create its own **Layouts** based on the available **Resources** (Cameras and Local files).

The following Layout Management actions are described in this section:

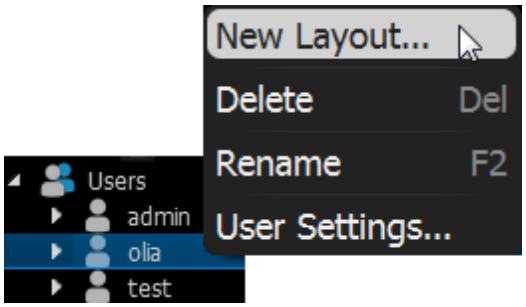
- Creating New Layout
- Setting up Layouts
- Assigning Layouts to Users (Admin Only)
- Deleting Layouts (Admin Only)
- Opening and Closing Saved Layouts.

Creating New Layout

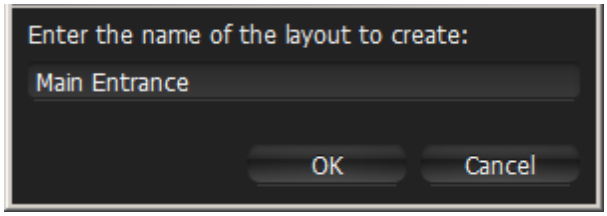
The simplest way to create new **Layout** is to **open a new Tab** (see "Tabs and Layouts"). However in this case **Layout** will be created **locally** and will not be saved on **Enterprise Controller** and will not be restored after next login. **Layouts** should be saved for future use.

To create new **Layout** for specific **User**:

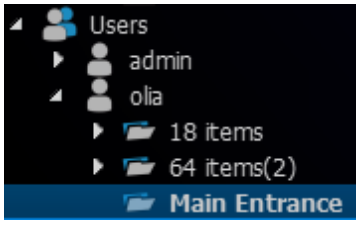
1. Find **User** in Resource Tree, **Right-Click** on Context Menu and choose *New Layout*:



2. Enter **Layout**'s *Name* and click OK (*Cancel* will discard all changes):



3. New **Layout** will be created and displayed in Resource Tree. A new **Tab** will automatically appear:



There are several ways to set up **Layouts**:

Set Up **Own Layouts**:

1. Open a new **Tab**, configure **Layout** and save.
2. Locate own **User** in Resource Tree, create new **Layout** using Context Menu and save.

Setting up **Layouts** for other **Users**:

1. Find the desired **User** in Resource Tree, create new **Layout** using Context Menu and save.
2. Open a new **Tab**, configure and save **Layout**, then associate with the desired **User** (See "Assigning Layouts to Users (Admin Only)").

Setting up Layouts

This section provides detailed instructions on how to configure layouts:

- Adding Items to Layouts
- Removing Item(s) from Layouts
- Using Backrounds (Maps or Plans) on Layout (E-Mapping)
- Adjusting Layout's Appearance
- Zoom Windows
- Locking Layouts
- Working with Multiple Qulu Windows
- Saving Layouts.

IMPORTANT. **Viewers** cannot change **Layouts**. Also it is not possible to change **Locked Layouts**.

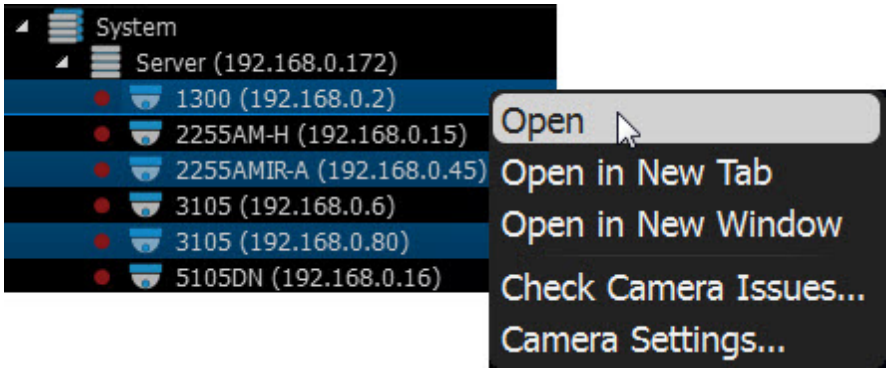
Adding Items to Layouts

More than one **Item** can be added to **Layout** at a time regardless of their source (live cameras, local video, images, etc.). Qulu allows **24 Items** to be displayed on the **x86** architecture and **64 Items** – on **x64**.

IMPORTANT. **Viewers** cannot add **Items** to predefined **Layouts**. They can only open and add **Items** to new **Tabs**. Also it is not possible to add cameras to **Locked Layouts**.

To add **Item**(s) to **Layout,** choose from one of the following:

- **Double-Click** on the **Item** in Resource Tree
- Invoke Context Menu in Resource Tree and select *Open*. Multiple items can be selected and added (***Ctrl*** + ***Shift*** and select the desired **Items**).



- Drag and drop from **Resource Tree**

- ***Ctrl*** + **Drag and Drop** items onto **Scene** – duplicates **Item**(s).To avoid duplication, release Ctrl and hit Esc, while **holding the left mouse button.**

  IMPORTANT. Hold ***Ctrl*** or use the mouse to draw a selection of multiple **Items** on **Scene**. To select all **Items** on **Scene,** use ***Ctrl + A***. Refer to "Selecting Items" for more information.

- Open **Local file**(s) or **Folder** – they will be added to the current layout (see "Opening Local Files Outside of Media Folders")

- ***Ctrl*** **+ Drag and Drop** from **Scene** to Resource Tree – dropped **Items** will automatically be added to **Layout** (use **Multi-Selection** to selection more than one item). To prevent duplication, release ***Ctrl*** and hit ***Esc*** while **holding the left mouse button**.

New **Items** will automatically occupy any available space. Grid cell aspect ratio will be adjusted automatically as per the existing item aspect ratio to occupy space on **Scene**. See "Changing Cell Aspect Ratio".

To open items directly from new **Tab**:

- Select desired **Item**(s) from Resource Tree and select *Open in New Tab* from Context Menu
- Drag selected **Item**(s) from Resource Tree and drop them onto Tab Navigator

- ***Ctrl*** + **Drag and Drop** items from **Scene** to Tab Navigator (**Multi-Selection** can be applied). To prevent duplication, release ***Ctrl*** and hit ***Esc*** while **holding the left mouse button**.

  IMPORTANT. It may be difficult to locate and add each item manually. Search may be very useful in configuring a new layout (see "Search").

How to configure a layout using **Search**:

1. Create a new Layout.
2. Enter keywords into the Search box. The search results will appear on **Scene** automatically.
3. By adding or deleting keywords from the search box, the items on **Scene** will vary.
4. Do not forget to save configured **Layout**.

Removing Item(s) from Layouts

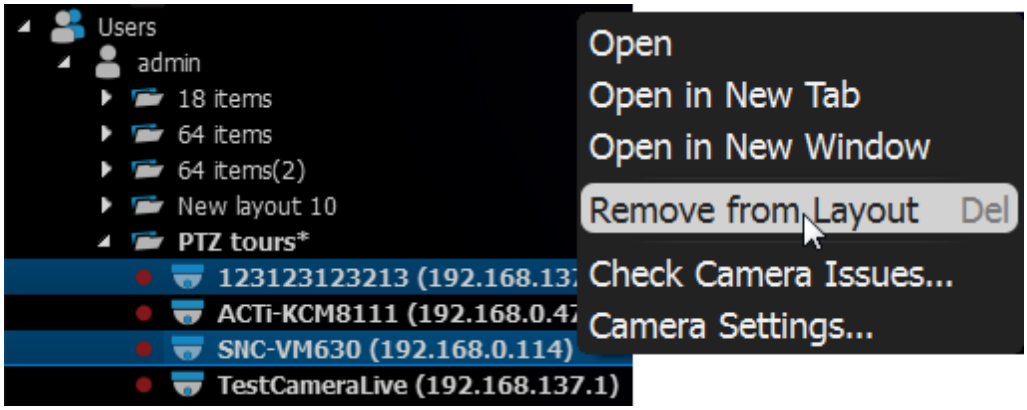
IMPORTANT. **Viewers** cannot change **Layouts** that are assigned by **Administrators**. They can only open new **Tabs** and add/remove **Items**, but cannot save. Also it is not possible to add cameras to **Locked Layouts**.

To remove Item(s) from Layout on Scene:

1. Select desired item(s) on **Scene**.
2. Proceed with one of the following:
   - Click to remove **single Item**
   - Open Context Menu and select *Remove from Layout* (or hit ***Del***) to remove **all selected Items**

To remove Item(s) from Layout in Resource Tree:

1. Expand **Users** and locate the desired **Layout** in Resource Tree.
2. Select desired **Item**(s) under specified **Layout**. **Multi-Selection** can be applied (see "Working with a Resource Tree").
3. Open Context Menu and select *Remove from Layout* (or hit ***Del***).

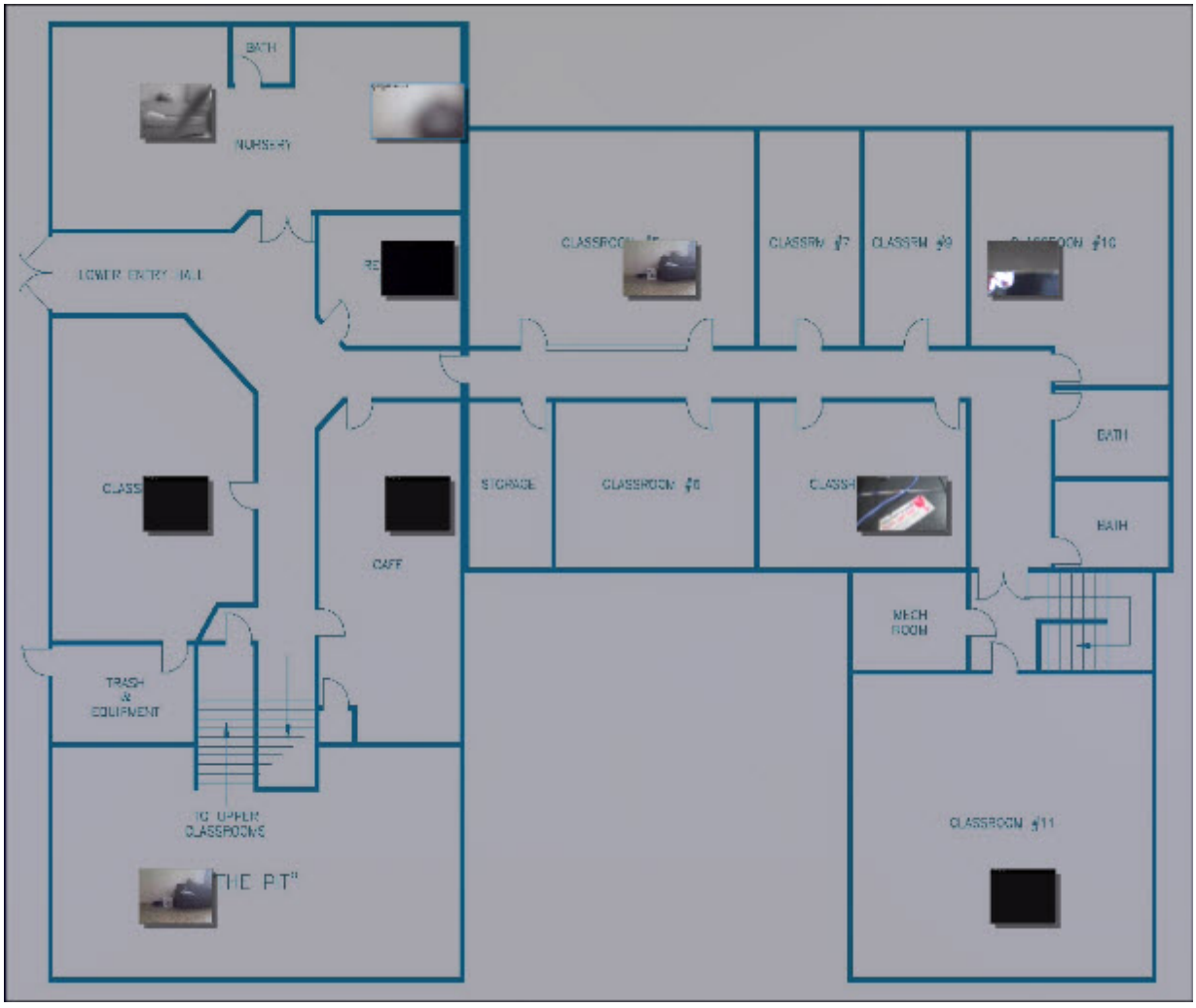


4. Confirm deletion by clicking *Yes*.

Note: grid cell aspect ratio will be adjusted automatically as per the existing item aspect ratio to occupy space on **Scene**. See "Changing Cell Aspect Ratio".

Using Backrounds (Maps or Plans) on Layout (E-Mapping)

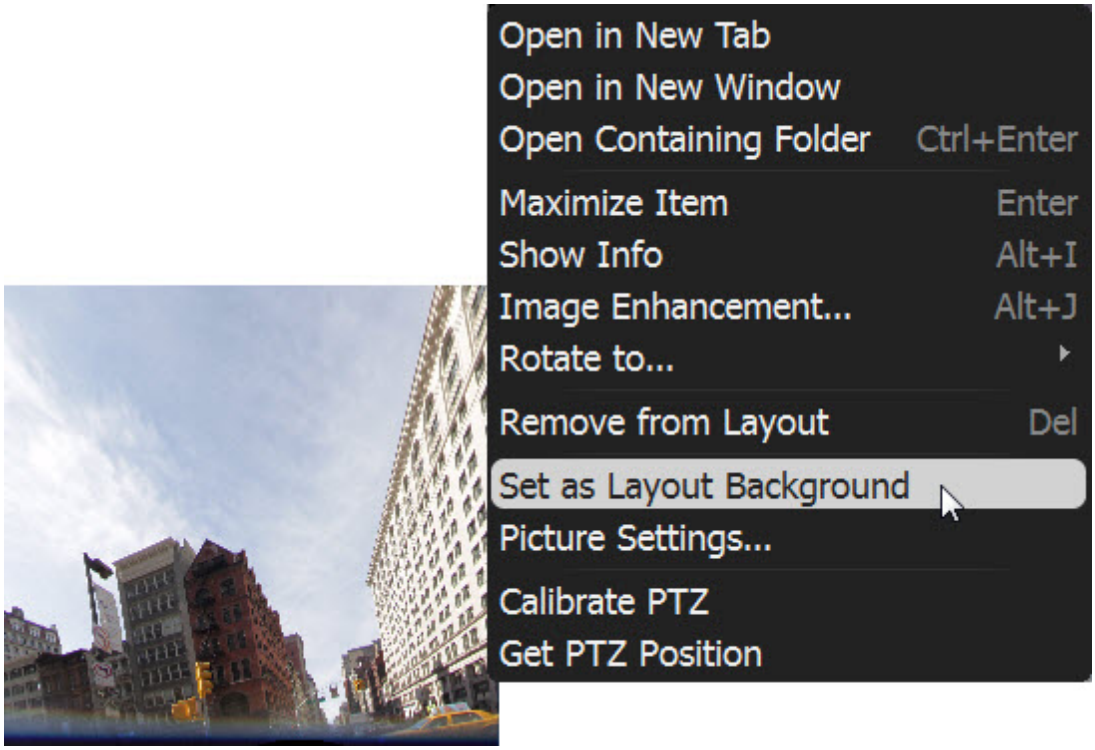
Qulu offers an ability to change background for **Layouts**. A schematic map or a building plan can be chosen as the background behind cameras for easy camera location and information accessability to **Users**.



IMPORTANT. **Viewers** cannot change **Layouts**. It is also not possible to change **Locked Layouts**.

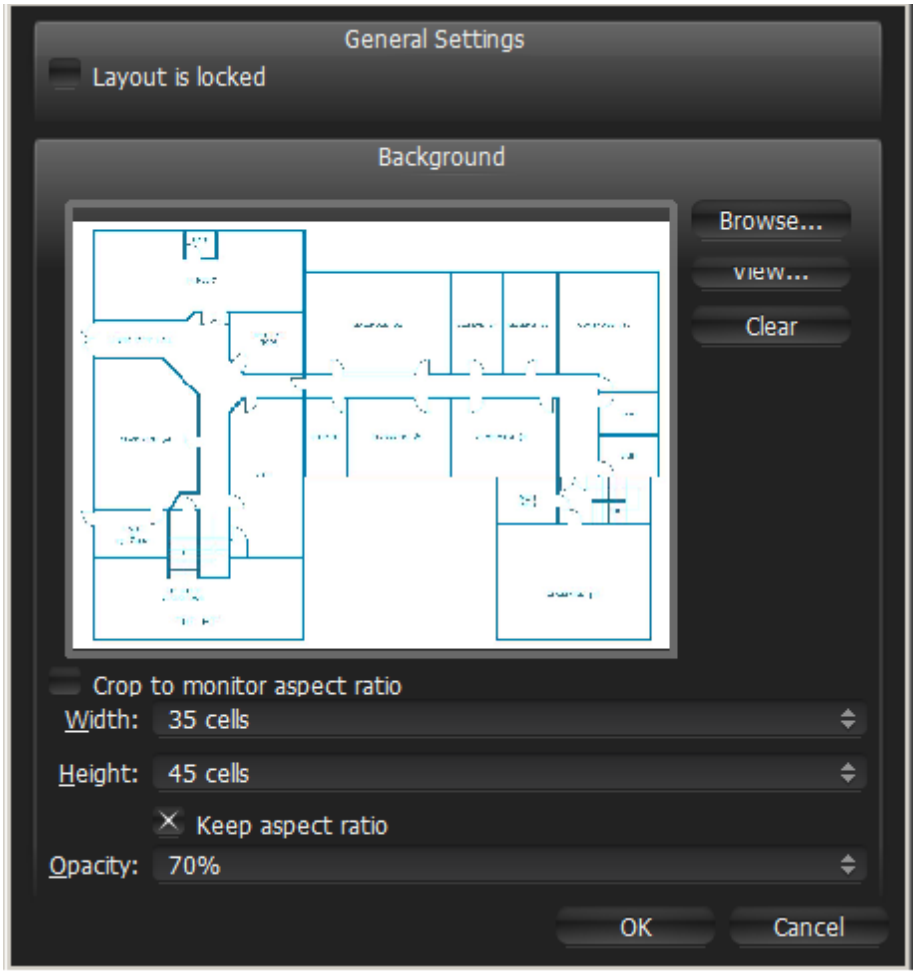
To set background for **Layout** (simple):

1. Open the desired picture on Scene.
2. Right-Click on the image to open Context Menu and select *Set as Layout Background*:



To set background for **Layout** (advanced):

3. Expand **Users** to locate the desired **Layout** in Resource Tree.
4. Open Context Menu (by clicking on any empty space within **Layout**) and select *Layout Settings...*



5. Click *Browse*... and select a desired image file to set as background.
6. Configure additional parameters:
   - *Crop to monitor aspect ratio* – if selected, then aspect ratio of the image will be adjusted according to the monitor. For instance, if monitor resolution is 1920x1080 (16:9) and image resolution is 1920x1200 (16:10), then the image will be cropped from both top and bottom.
   - *Width* and *Height* – image dimensions within cells. For instance, it is possible to place twenty items on a 5x4 layout. The greater the dimensions the lesser the cells are.
   - *Opacity* of the image (in percents).
5. Click *OK* when finished. To discard changes, click *Cancel*.
6. Add, Remove, resize or move cameras across background (see "Adjusting Layout's Appearance").
7. Lock Layout if needed.
8. Do not forget to Save Layout.

Adjusting Layout's Appearance

Any video manipulation can be performed in the application to customize **Layout**:

- Selecting Items
- Zooming while Working with Layouts
- Moving and Swapping Items within Scene
- Resizing Items within Scene
- Using Fit-In-View
- Changing Distance between Items
- Changing Cell Aspect Ratio

It's recommended to first make an item selection and configure the look on **Scene**.

IMPORTANT. **Viewer** is allowed to perform any operations, except changing **Locked Layouts**.

Selecting Items

Click on **Item**(s) to **select**. The selected **Items** will expand on the screen. To bring it back to normal, click again. ***Arrow keys*** may be used to scroll through **Items**.

To select more than one Item:

- **Click and Drag** over **Items** with a mouse to draw a selection.
- Hold ***Ctrl*** and **Click** on several **Item**s. **Click again** to remove selection. **Click** without ***Ctrl*** to discard the current selection.
- Use ***Ctrl + A*** to select all **Items** on **Scene**.
- **Click and Drag** mouse holding ***Shift*** to bring the selected items to **Scene**.

The selected items are outlined or filled with a color:

See also how to select **Item**(s) in "Resource Tree".

Zooming while Working with Layouts

There are several ways to **Zoom** while working with Qulu.

- **Zoom whole Layout -** Use ***ALT + Mouse Wheel***
- **Zoom while a single Item is Fullscreen -** Use ***Mouse Wheel*** (see "Zoom")
- PTZ/Fisheye Zoom - use "+" and "-" buttons on Item (see "Setting up PTZ on PTZ and Fish-Eye Cameras").

Moving and Swapping Items within Scene

Scene consists of cells. Each cell may contain one **Item**. The initial aspect ratio of a cell is **16:9** but it can be changed to **4:3** (see "Changing Cell Aspect Ratio").

IMPORTANT.It is not possible to change **Locked Layouts**.

In order to move **Item**, **Click** on it and **Drag** it to a new position (grid cell borders are visible while in motion). Multiple items can also be moved.

If the desired position is already occupied, **Items** will be swapped (if possible).

If swapping is not possible, the target cell will be marked red:

If bigger **Item** is being replaced by a smaller one, they will swap sizes as well as positions.

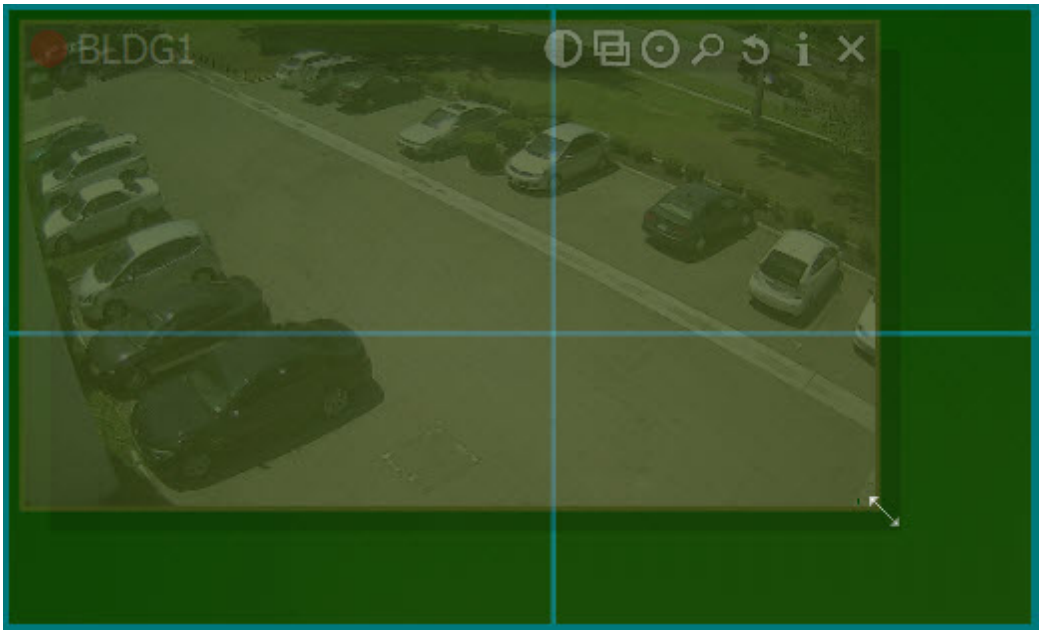
Resizing Items within Scene

IMPORTANT. It is not possible to change **Locked Layouts**.

Resizing items is an easy operation in Qulu. To resize, select the edge on **Item**, **Click and Drag** the mouse to resize.

Item is resized according to its proportions, so it can occupy 1, 4, 9 cells etc.

If resizing is possible, the new cells are highlighted in green:



If resizing is not possible, the cells will appear red:

In this case the best practice is:

1. **Move the entire Scene** using a **Right-Click Drag**.
2. **Resize an Item** to occupy the available space.

OR

3. **Move the desired Item** away from the rest of **Items**
4. **Resize the Item** to occupy the available space.

Using Fit In View

This feature allows users to revert the view to maximum in order to view all **Items** conveniently. This can also be used when **zooming** or **moving** the entire **Scene**.

Fit In View can be performed by **Double-Clicking** on any empty space on **Scene** (or by **Right-Clicking** on Context Menu and selecting *Fit in View*).

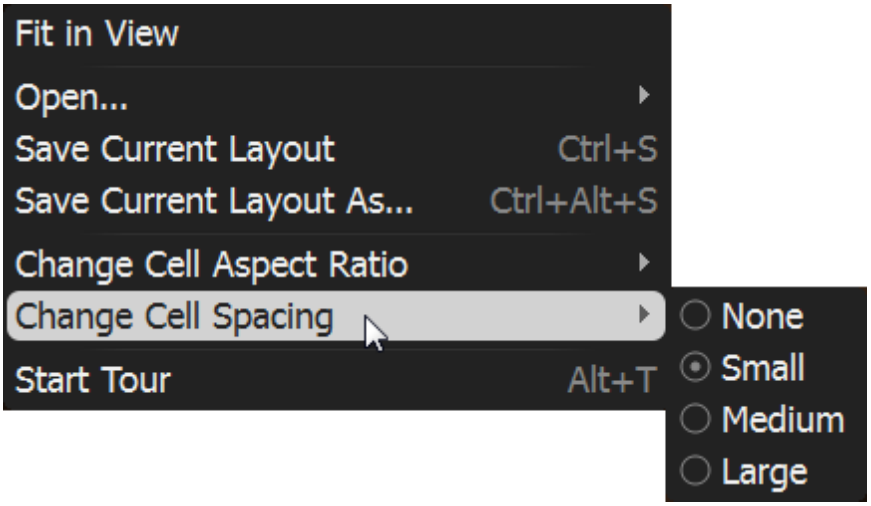
Also **Fit In View** is performed automatically if:

- Change in view mode: **Window** or **Fullscreen** (see "Full Screen and Window Mode")
- Change in Qulu window size.

Changing Distance between Items

This feature is used when multiple **Items** need to be stitched together or positioned closer to each other. A good example is a panoramic view derived from four individual single-sensor cameras to compose a 180 degree view.

To adjust the distance between **Items**, use *Change Cells Spacing* Context Menu item or ***Ctrl*** + **Mouse Wheel** on **Scene**:



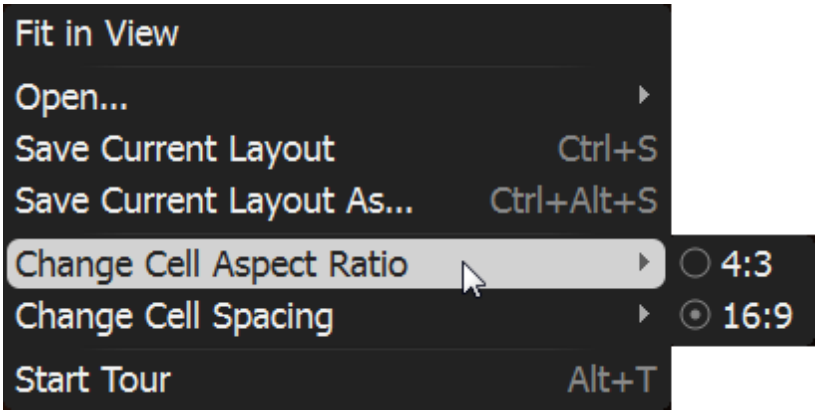
IMPORTANT. If aspect ratio of an item is not **4:3** or **16:9** the extra space will remain.

Changing Cell Aspect Ratio

Cameras provide video in **4:3, 16:9** or custom format. Grid cells aspect ratio is changed dynamically per item's aspect ratio to occupy **Scene** space.

This feature is used to occupy **Scene** space efficiently: **cell aspect ratio** should be equal (or similar) to **Camera aspect ratio**.

Additionally, the aspect ratio of cells can be changed manually. To proceed, use *Change Cell Aspect Ratio* Context Menu item (invoke Context Menu on any empty space on **Scene**):



Zoom Windows

Qulu provides a great feature that allows users to create an unlimited number of digital **Zoom Windows** for a single **Camera.** These windows can be placed on **Layouts** and saved for future use.

IMPORTANT. It is not possible to use **Zoom Windows** on **Locked Layouts**.

To configure **Zoom Window** for **Camera**:

1. Open **Camera**.
2. Click on to drag a rectangle on an item. A new item will appear on **Scene**.
3. Move **Zoom Window** or resize it by dragging its edges. **Zoom Window** can be moved between **Cameras** on **Scene**.
4. To close **Zoom Window,** close the corresponding item.

Note: it may be very convenient to use Zoom Windows of fish-eye **Cameras**. See "De-warping Fish-Eye Cameras" for more information.

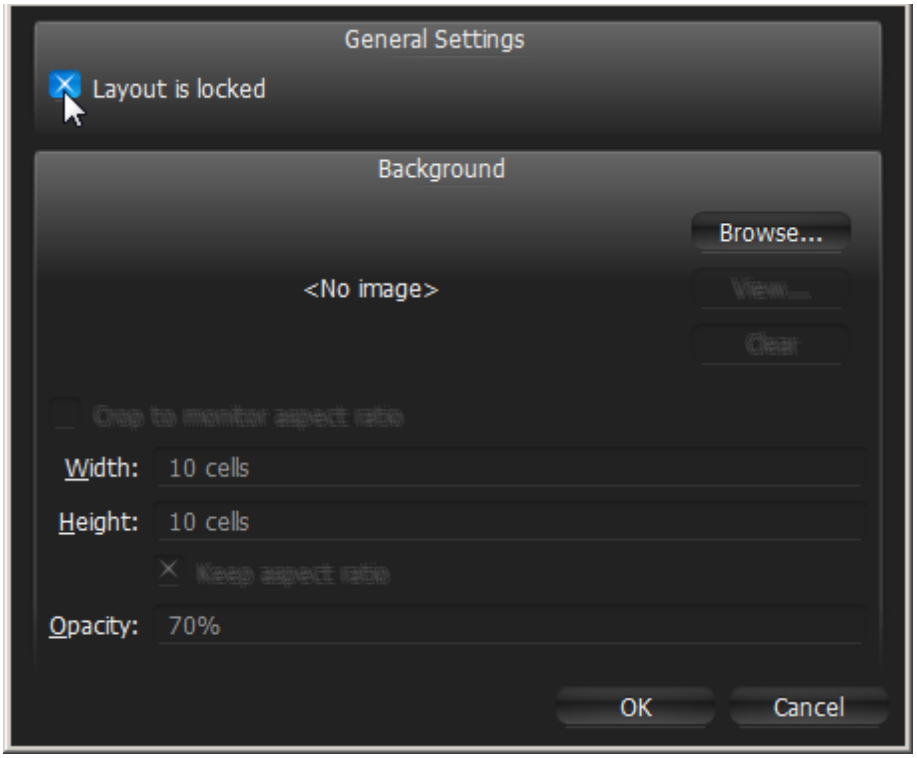
Locking Layouts

To prevent accidental changes to **Layouts**, Qulu offers a locking capability. Once locked, the following cannot be performed:

- Adding or Removing items
- Change Background
- Moving and Swapping Items within Scene
- Resizing Items within Scene
- Deleting Layouts.

To lock **Layout**:

1. Open Context Menu (click on any empty space wtihin **Layout**) and select Layout Settings...
2. Check *Layout is locked*.



3. Click *Apply* or *OK* when finished. To discard changes, click *Cancel*.

Working with Several Qulu Windows

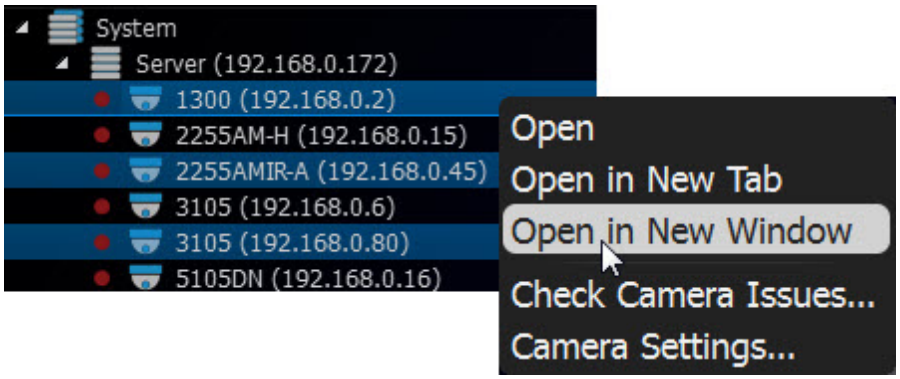
It is possible to set up **Layouts** on multiple Qulu windows in a **multi-monitor environment**.

IMPORTANT. This feature is not supported on **Mac OS**.

To open a new window, click on *Main Menu –> New –> Window* (or press ***Ctrl + N***).

Also selected **Items** may be opened in a new window:

1. Select desired **Items** in Resource Tree or on Scene (**Multi-Selection** can be applied, see "Selecting Items").
2. Invoke Context Menu and select ***Open in New Window***.



Finally, it is possible to **drag Items from one window to another** (only **Administrators** can drag **Items** to predefined **Layouts**):

1. Select desired **Items** in Resource Tree or on Scene (**Multi-Selection** can be applied, see "Selecting Items").
2. Hold ***Ctrl*** and **Drag** selected **Items** to a new window.

Saving Layouts

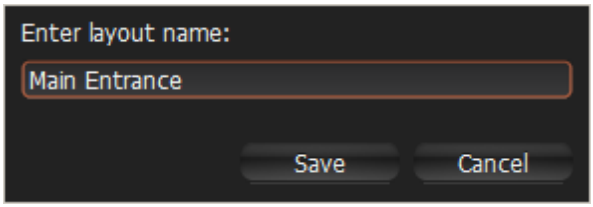
To retain any changes made to **Layout**, **User** must save it.

Note: current playback position and selection is saved for **Layout** as well. After Qulu is closed, all saved layouts that were opened in **Tabs** prior to closing, will be restored.

Layout should always be saved in case of any changes. If any changes are made, an asterisk will appear in the corresponding **Tab** and in Resource Tree:

To save **Layout**:

- Open Context Menu on **Scene** (on empty space) and select *Save Current Layout* (or press ***Ctrl + S***). **Layout** will be saved to the previously assigned file name (the **Tab**'s caption).
- Open Context Menu on **Scene** (on empty space) and select *Save Current Layout As* (or press ***Ctrl + Alt + S***). **Layout** will be saved as specified by **User**:

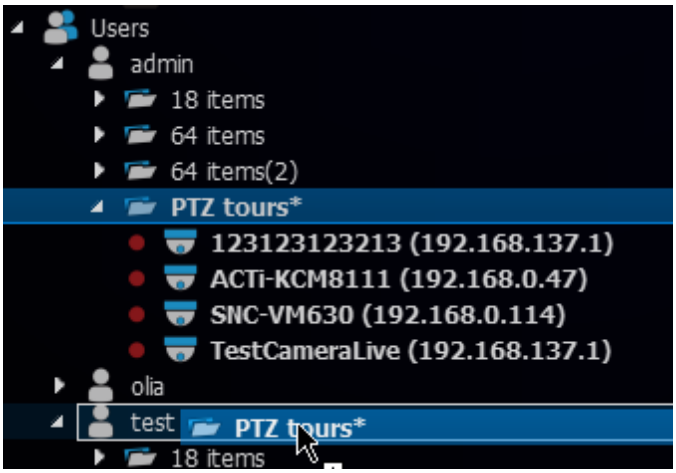


- Find the desired **Layout** in Resource Tree, invoke for Context Menu and select *Save Layout*.

IMPORTANT. Saved **Layout** is activated immediately (if running on multi-machines, all saved changes to **Layout** will reflect on all machines identically). Refer to "Opening and Closing Saved Layouts" for more information.

Assigning Layouts to Users (Admin Only)

To duplicate **Layout** for another **User**(s), **Drag and Drop Layouts** within Resources Tree:



Administrator can then modify **Layouts** as needed.

Deleting Layouts (Admin Only)

To delete **Layout** from Resource Tree:

1. Find and select desired **Layout**(s) in Resource Tree.
2. Invoke on Context Menu and choose *Delete Layout* (or press ***Del***).
3. Accept deletion by clicking on *Yes* or press *Cancel* to discard all changes.

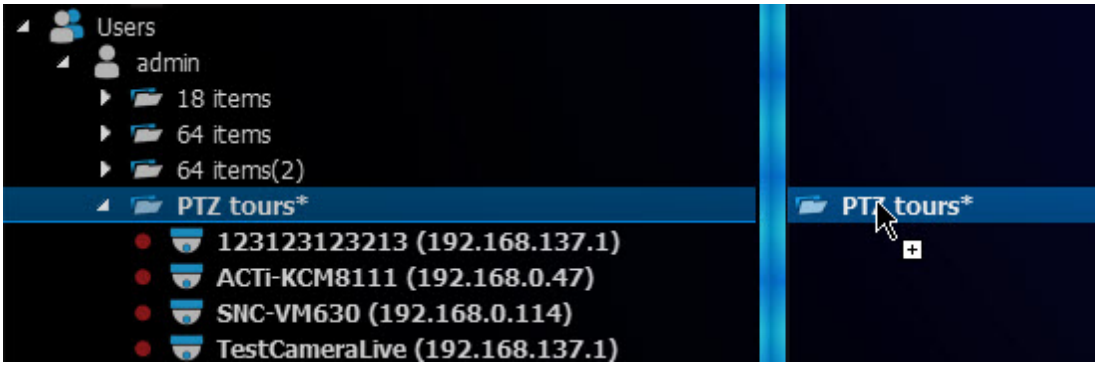
If the layout that is opened on another computer is deleted, all items **will disappear**.

Note: Locked Layouts cannot be deleted!

Opening and Closing Saved Layouts

As **User** logs into Qulu, all existing **Layouts** are listed in Resource Tree. To open an existing **Layout**, find the desired layout in Resource Tree and perform one of the following:

- **Drag and Drop Layout** from Resource Tree to **Scene:**



- Open Context Menu and choose *Open Layout* (or press ***Enter***).

To open multiple **Layouts**, select the desired layouts in Resource Tree (using **Multi-Selection**) and do one of the following:

- Drag selection to **Scene**.
- Open Context Menu and choose *Open Layouts*.

Layouts will be opened in separate **Tabs**. If **Tab** already contains this **Layout**, it will not be opened again.

Note: after Qulu is closed, all saved **Layouts** opened in **Tabs** will be restored when **User** logs back in.

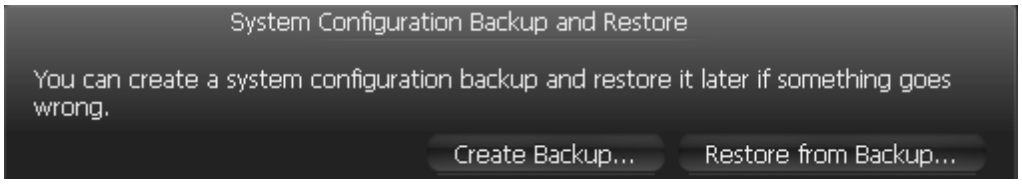
Backing up and Restoring Qulu Database

Qulu provides simple mechanism to perform backup and restore of system settings. It is done by backing up the Qulu database as a single file. Database contains all system configuration.

IMPORTANT. It is recommended to perform restore operation on the same computer backup has been saved.

To back up Qulu database:

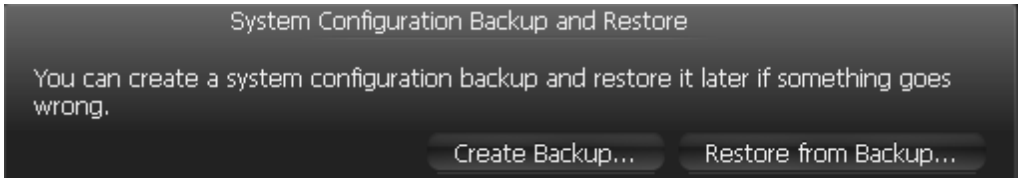
1. Open Main Menu and go to *System Settings*.
2. Go to the *Server* tab.


System Configuration Backup and Restore
You can create a system configuration backup and restore it later if something goes wrong.
Create Backup...
Restore from Backup...

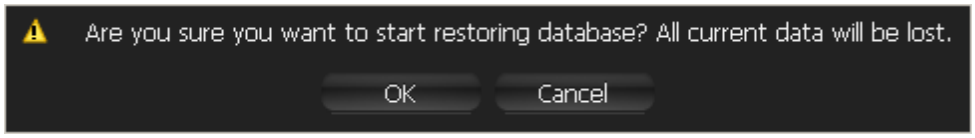
3. Click *Create Backup...* The window will open. Choose the desired location on the local file system to save the backup then click *Save*.

To restore Qulu settings from backup:

1. Open Main Menu and go to *System Settings*.
4. Go to the *Server* tab.


System Configuration Backup and Restore
You can create a system configuration backup and restore it later if something goes wrong.
Create Backup...
Restore from Backup...

5. Click *Restore from Backup...* The window will open. Choose the backup file then click *Open*.



6. If click OK, database will be restored.

   IMPORTANT. It may be necessary to restart **Media Servers** and Qulu Clients after restore.

Playback in Qulu

Qulu offers a smooth playback feature. See "Playback Panel" for more information on **Playback** interface.

The following can be played back:

- **Cameras** (see "Watching Cameras in Qulu"). It is possible to view archive and live in **Time Line** among other features helping **User** to perform search archived footage.
- **Local files**: **Video Files**, **Images** (see "Playing Back Local Files in Qulu").

The following operations can be performed in addition to playback:

- Forensic Analysis
- Exporting
- Adjusting Volume
- Tours

All operations described in this section do not require administrative privileges. However, some operations may require certain permissions. See "Introducing User Roles" for details.

Watching Cameras in Qulu

Qulu provides a powerful and easy camera playback engine that enables users to quickly find a video fragment, perform forensic analysis, capture screenshots and export video in just a few clicks.

This section provides a detailed description on camera playback. The following operations can be performed:

- Navigating through Archive and Live
- Searching through Archive

Note: It it recommended to read the following section prior to moving on to the next step: "CPU and Bandwidth Saving during Playback (RADASS)".

Lastly, videos can be displayed in a slide-show mode. See "Tours" for more details.

CPU and Bandwidth Saving during Playback (RADASS)

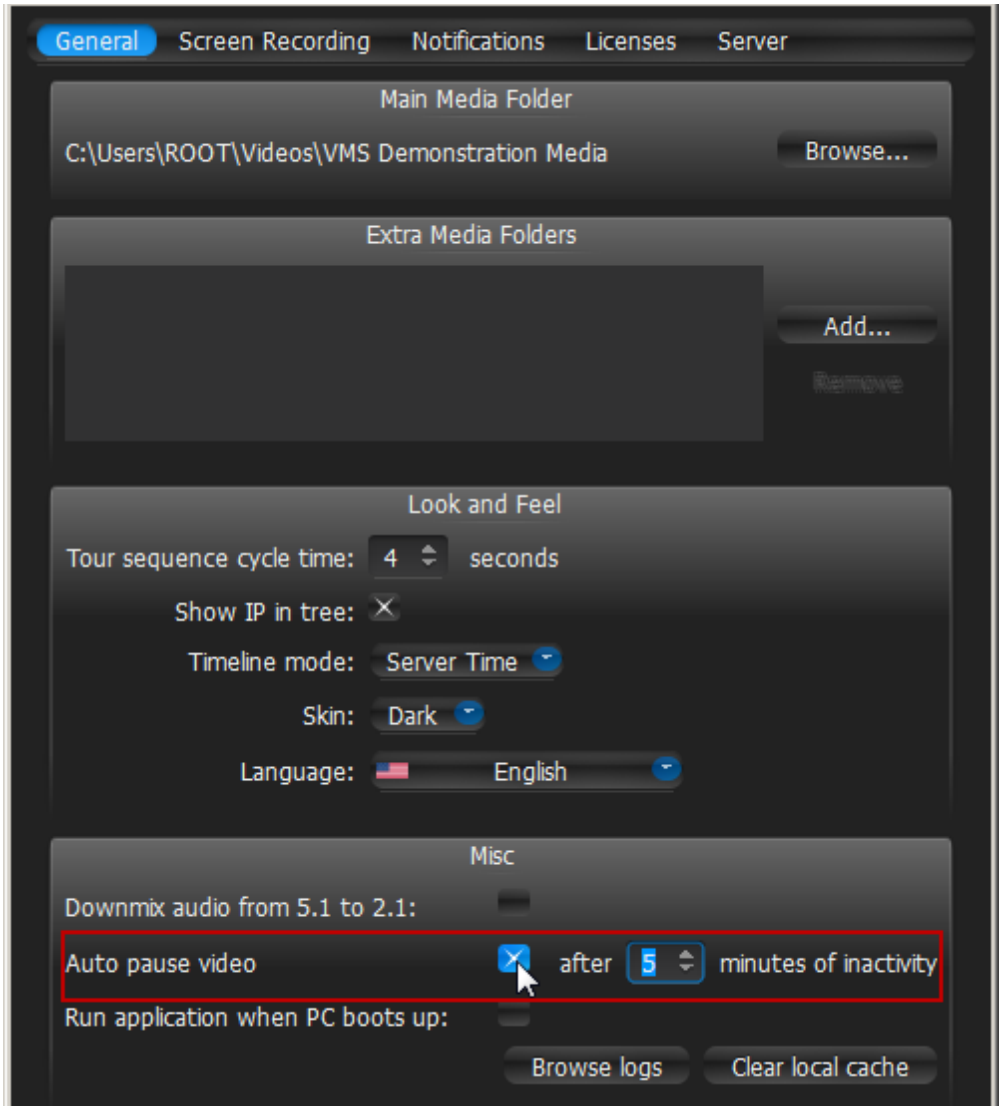
Qulu's architectures provides significant CPU and network bandwidth savings by acquiring multiple streams from a single camera: **High Resolution** (regular) and **Low Resolution** (approximately 10 times less bandwidth). If there is not enough bandwidth between **Client** and **Media Server** to display the **High Resolution** stream while viewing a camera, then the camera is automatically switched to **Low Resolution** mode.

In case of insufficient CPU, a user may experience difficulties with displaying too many videos simultaneously (examples: running over 20 full high resolution videos at the same time, fast forwarding multiple full high definition videos at the x16 speed, etc.). In this instance, cameras are switched to a **Low Resolution** stream. As a result, CPU will yield a much smoother playback.

Additionally, it is possible to choose resolution **manually**. To do so, **Right-Click** on Scene's empty space and choose *Change Resolution...* The changes are applied once to the entire **Layout** and will be reverted back to **Auto** whenever a user re-opens **Layout**.

Note: this feature requires support of **camera dual-streaming.**

Lastly, Qulu offers significant bandwidth savings by auto-pausing video. If viewing video from **Camera** in fullscreen, the video will be paused due to inactivity after a certain period of time. To set this option, open Main Menu and check *Auto Pause Video*, then set the desired time interval:



Navigating through Archive and Live

It is very easy to navigate through **Live** and **Archive** in Qulu. Here are some tips and shortcuts.

IMPORTANT. It is only possible to navigate through **recorded fragments (chunks)**. **Position Slider** to the dark area will jump to the next available recorded fragment (displayed in green on **Time Line**).

By default, all **Cameras** are set to display **Live** if opened for the first time.

Note: all **Users** are allowed to view cameras **Live**. However, to view Archive, **Viewers** must have the appropriate **permissions**.

Search **Archive**:

- **Click** on any desired position on **Time Line** or **Time Scale**.
- **Drag Time Slider** to the desired position. The picture will refresh while dragging.

Time Scale navigation:

- Zoom **Time Scale** using **Mouse Wheel** for finer selection
- Move **Time Scale Scrollbar**
- **Double Click** on **Time Scale Scrollbar** to zoom out

Go to **Live**:

- Press LIVE or ***L***
- Move **Position Slider** all the way to the right

Play/Pause: Press or ***Space***

Fast Forward or **Rewind**:

- Press or ***Ctrl + Right Arrow*** to increase speed
- Press or ***Ctrl + Left Arrow*** to decrease speed
- Available speeds on play: -16x, -8x, -4x, -2x, 1x, 2x, 4x, 8x, 16x
- Available speeds op pause: -2x, -1x, -0.5x, -0.25x, 0x, 0.25x, 0.5x, 1x, 2x
- Use **Speed Slider**: very left position is -16x (-2x on pause), very right one – 16x(2x on **Pause**)
- **Click** on **Speed Slider** to change speed temporarily and then revert to 1x (0x on **Pause**)
- **Drag Speed Slider** to change speed permanently (or use **Mouse Wheel** on **Speed Slider**)
- If **Rewinding** while in **Live** mode, the position will be switched to **Archive**
- If **Fast Forwarding** while viewing archive, camera(s) will be switched to **Live** if the very right position is reached.

Previous/Next Frame (**Pause** only):

- Press or ***Ctrl + Right Arrow*** to skip to the next frame
- Press or ***Ctrl + Left Arrow*** to skip to the previous frame
- Use **Mouse Wheel** on **Speed Slider** when on **Pause**

Previous/Next Recorded Fragment:

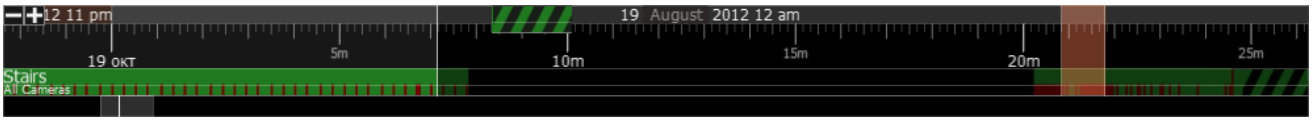
- Press or ***Ctrl + Right Arrow*** to skip to the next frame
- Press or ***Ctrl + Left Arrow*** to skip to the previous frame

Useful sections:

- Pan-Temporal Time Line
- Navigating through Several Cameras Synchronously.

Pan-Temporal Time Line

Pan-Temporal Time Line is a convenient way to navigate through **Live** and **Archive** footage (below).



The current time is indicated by **Position Slider**. The very right position indicates that **Live** video is currently played back. If slider is moved to the left, the playback automatically is switched to the **Archive**.

IMPORTANT. It is not possible to navigate through the last minute of archive (this increment is represented in stripes).

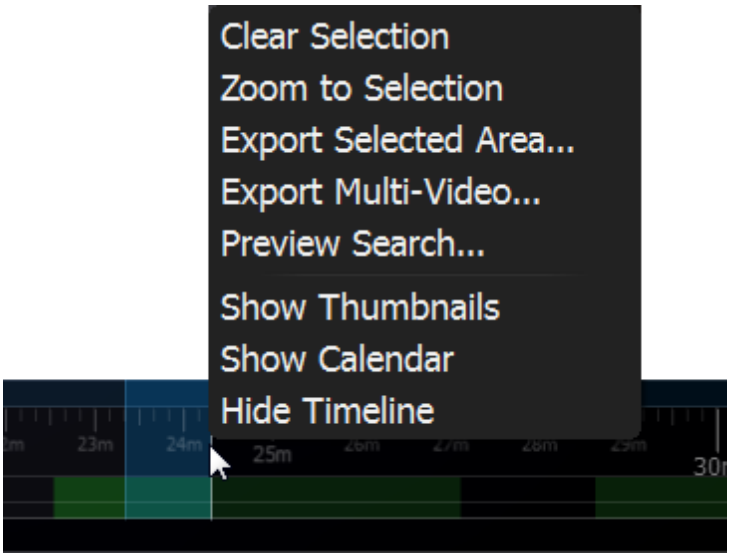
Time Scale is displayed on the bottom of the **Time Line**. It contains marks indicating the time. **Time Scale** can be zoomed in and out by mouse wheel or buttons at the left. This is extremely useful when trying to find a particular event navigating through a long period of time. **Double Click** on **Time Line Scroller** (the very bottom) to fully zoom out.

To zoom to the particular region select the desired region by the following ways:

Select the region to export on **Time Scale**:

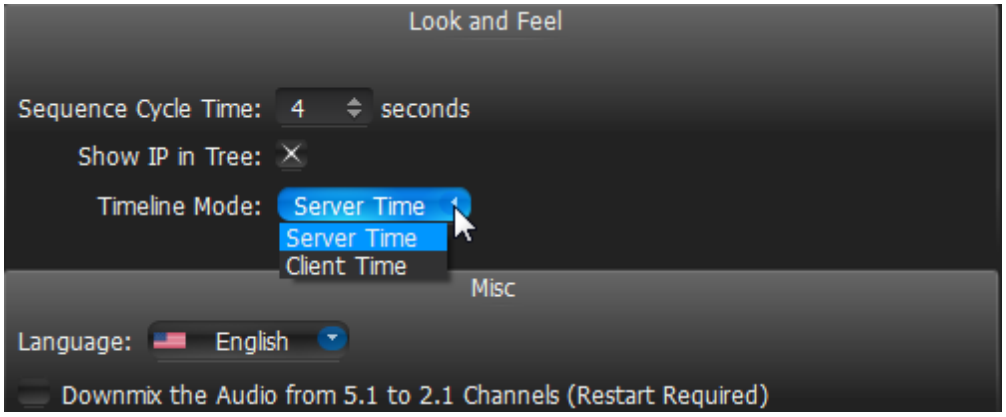
- Use **Right Click Drag**
- Open Context Menu on **Time Scale** and click *Mark Selection Start* (or press "*[*"), then *Mark Selection End* (or press "*]*")
- To clear selection, use the corresponding Context Menu item
- Adjust the region to export by dragging edges.

Then open Context Menu on the Time Line and choose *Zoom to Selection*.



Time Line can display **Local** or **Server** time (specified in System Settings). To change the setting:

1. Open **Main Menu** and choose System Settings
2. Use the *Timeline Mode* setting in *Look and Feel*:



3. Click *OK* when done or *Cancel* to discard changes.

Note: Export and Preview Search features will depend on this settings as well. This setting does not affect **Recording Schedule** (always based on **Media Server Time**).

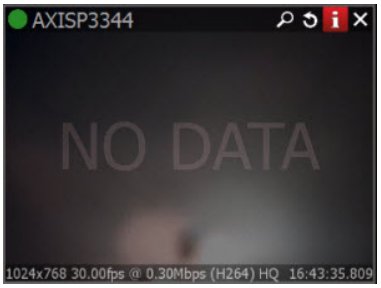
Time Line's color indicators:

- **Black** – empty space (no recording took place in this period of time)
- **Green** – represent recorded fragments
- **Red** – motion regions. Displayed only if **Smart Search** is active. See "Performing Smart Search".

It is possible to navigate through recorded fragments only. When moving **Position Slider** to the black area (no recording), it will jump to the next available recorded fragment. If several live **Cameras** are currently displayed, all recorded fragments are combined on **Time Line** (in the lower *All Cameras* line).

Navigating through Several Cameras Synchronously

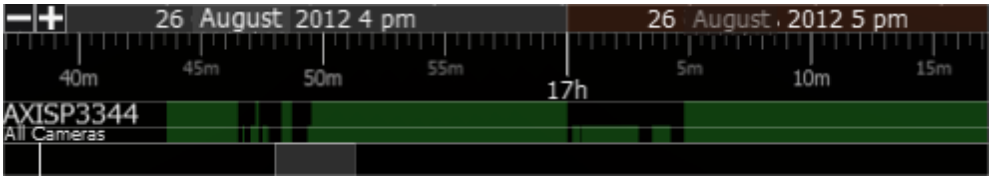
Qulu provides a powerful engine that enables users to navigate through multiple cameras: if several **Cameras** are displaying at the same time, they can be **synchronized**.



If **User** performs search, fast forward, rewind or search by frame – each camera will be synchronized.

However, recording may be set up differently. If no recording took place over a certain period of time, **NO DATA** will appear on the camera view.

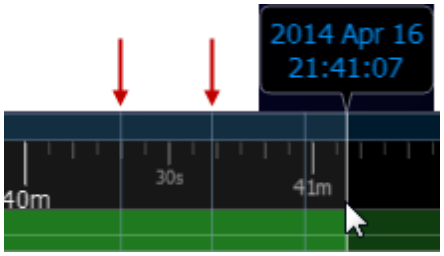
Recorded fragments are displayed on the **Time Line** in two rows:



- The upper row displays fragments for **Camera** selected on **Scene**
- The lower row – for all **Cameras** displayed on **Scene**

It is possible to disable **Synchronization** (press SYNC button). If no **Item** is selected, the selection will move to the previously selected item, which will become the only item affected by playback controls (seek, speed etc).

Thus, if **Synchronization** is disabled, it is possible to seek each **Camera** in a different position. In this case **Time Line** displays positions for all **Cameras** played back (see blue markers on the picture):



If **User** selects **Camera** on **Scene** and enables **Synchronization** again, all other **cameras** will get synchronized with the selected **Camera** (**Position** and **Speed** will be synchronized).

Searching through Archive

Qulu provides many features that make archive search faster, more convenient and intuitive. Since archive may contain significant video data (taken over several months), it is crucial to minimize the time spent by a user on searching a particular event.

The following search methods are introduced:

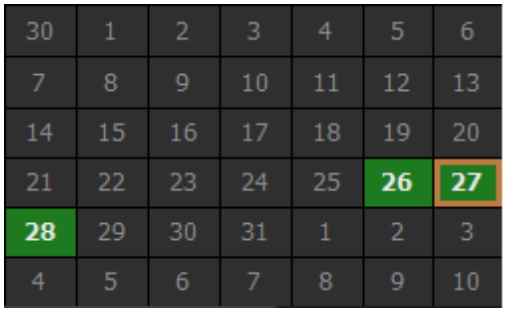
- **Calendar** – pan temporal time line can zoom in on selected date to make search easier (see "Using Calendar").
- **Smart Motion Search** – select a region on video and allow for the application to automatically refine the archive and highlight the fragments that involved motion. See "Performing Smart Motion Search".
- **Thumbnail Navigation** – small previews are displayed on top of the Time Line to help locate a particular scene. See "Using Thumbnails for Better Navigation".
- **Preview Search** – select a region and allow for the application to provide videos that represent a time period based on time stamps. See "Preview Search".

Using Calendar

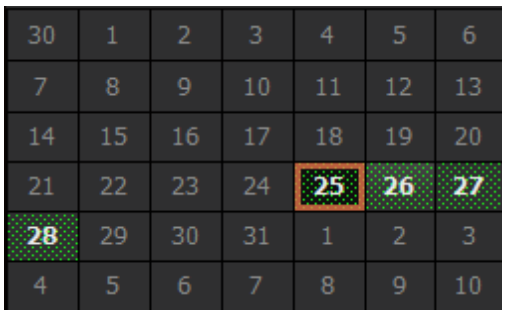
This type of search helps the user to locate an event that took place on a particular date and time.

To perform a calendar search:

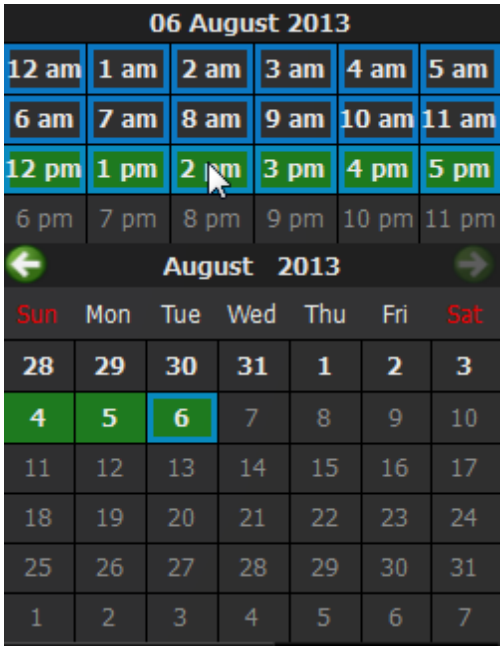
1. Open **Camera** that contains the archived event.
2. Press CLND. Calendar will appear above **Time Line**. The dates that are displayed on **Time Line** are highlighted in green:



3. Select a desired date in **Calendar**. To select multiple dates , use ***CTRL***. **Time Line** zoom will automatically change to reflect the selected date(s) only. If the archive contains data outside the visible range, it will appear in shaded green:



4. Select a desired hour in the upper part **Calendar**. To select multiple hours, use ***CTRL***. **Time Line** zoom will automatically adjust to display the selected hour(s) only.



Performing Smart Motion Search

Smart Motion Search enables **User** to perform fast and intuitive archived motion search.

To perform **Smart Motion Search**, select the desired region and Qulu will display all fragments that contain motion throughout the archive (scanning through a yearly archive only takes a few seconds).

IMPORTANT. **Smart Motion Search** in Qulu assumes the selected **Camera** supports **Motion Detection**. It is important to perform motion setup as well. See "Setting up Motion Mask and Motion Sensitivity".

To perform **Smart Motion Search**:

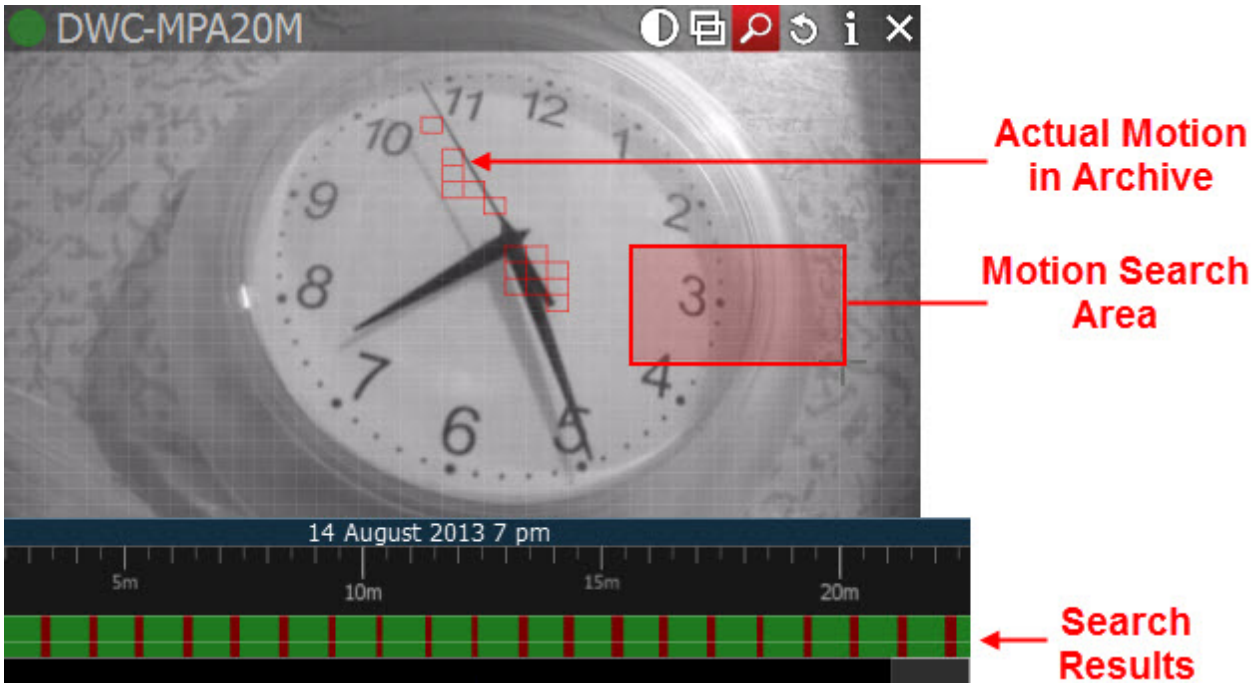
1. Open Motion Grid on the camera:
   - use **Camera**'s **Quick Button** ( )
   - open **Camera**'s Context Menu and choose *Motion Grid* (or select it and press ***Alt + G***)

   Motion Grid will appear:

   Note: if red fragments appears in motion zones, **Motion Detection** is supported by **Camera**.
2. Select the region the motion should be searched on:
   - Hold ***Shift***, **Left Click and Drag**:
   - ***Ctrl*** + **Click and Drag** to add another region
   - **Click and Hold Left Mouse Button** or use Context Menu (*Clear Motion Selection*) to clear all regions.

IMPORTANT. Motion will not be visible and detected on a region marked as **Motion Mask.**

As soon as the region is selected, **Time Line** will be populated with **red bars**. Each bar indicates recording period that contains motion.



IMPORTANT. Navigation in **Time Line** is possible by red fragments only until **Smart Motion Search** is **off.**

To disable **Smart Motion Search**, clear all regions in **Motion Grid** or disable pressing the button (or use Context Menu *Hide Motion Grid* or ***Alt + G***).

Using Thumbnails for Better Navigation

The **Thumbnail** feature is a fast and convenient way to navigate through archive. **Thumbnails** are single snapshots taken from archived video footage that are displayed on the **Time Line**. This feature serves as another useful forensic tool for analyzing video.

To open **Thumbnails**:

1. Click on the desired **Camera**.
2. Click on THMB button or point a mouse cursor over the top of **Time Line**, click and **pull it up**:

If no **Thumbnails** are displayed, then there is no archive available for this particular **Camera**.

Thumbnails panel can be re-sized. To re-size, point a mouse cursor over **Time Line**, click and pull it up or down.

The white dots under the pictures point on the exact archive place where the shot has been taken. When clicking on **Thumbnail**, the current playback position will jump to the corresponding spot in the archive.

To close **Thumbnails**, press THMB again or pull the **Thumbnails Panel** down.

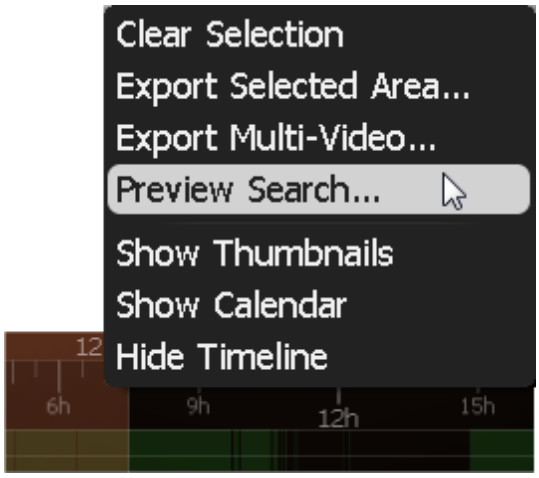
See also "Preview Search".

Preview Search

This feature helps to search data through large archives. It breaks the selected range of time into smaller time increments and displays these increments as separate **Items**. For instance, it breaks a month period into ten 3-days periods displaying them as separate **Items**, which makes it possible to locate a specific event in one of these periods (then breaking this period into nine 8-hour periods and so on). Finally location of a specific event in archive may take 3-5 such iterations for initial period of several months.

To perform **Preview Search**:

1. Select the desired camera on Scene.
2. Select the region to export on Time Scale:
   - Use **Right-Click Drag**
   - Open Context Menu on **Time Scale** and click *Mark Selection Start* (or press "***[***"), then Mark Selection End (or press "***]***")



   - To clear selection, use the corresponding Context Menu item
   - Adjust the region by dragging edges to export
   - To make zooming easier, zoom on **Time Line** using a **Mouse Wheel**

3. Invoke Context Menu and choose *Preview Search*.

   New **Tab** will be opened. The **Tab** contains several **Items** representing the selected **Camera** in different periods.

   If click on **Items**, the selection on **Time Line** will display the particular period in archive related to the selected **Item**.

   If the selection does not contain archive data this feature is not available.

4. Locate the period of time the desired event took place and select appropriate **Tab**.
5. Repeat steps **1-3** on the desired **Item** on **Preview Search Tab** to refine search.

It is also possible to perform the following actions in **Preview Search Tab**:

- Navigate through archive
- Thumbnail Navigation
- Smart Motion Search
- Calendar Search
- Tours
- Screenshot
- Export.

Playing Back Local Files in Qulu

In addition to powerful camera playback engine Qulu can also act as **Media Center**: it can play back almost any file. Most major codecs and most major containers are supported. This section contains detailed description of **Local Files** playback:

- Local files structure in Resource Tree
- Configuring Media Folders
- Opening Local Files Outside of Media Folders
- Navigating Through Local Files.

Additionally it is possible to export fragments from video files (see "Exporting") and to take screenshots (see "Taking Screenshot").

Finally, all features described in the "Forensic Analysis" section can be applied to local files.

IMPORTANT. Some video files may contain 5.1 sound stream. In order to play back those files on stereo speakers:

1. Open Main Menu and choose System Settings in the General tab.
2. Check *Downmix Audio from 5.1 to 2.1 Channels*.
3. Restart **Client**.

Local files structure in Resource Tree

All local files are displayed in Resource Tree under the *Local* node, which include:

- Files that are located in **Qulu Media Folders** (see “Configuring Media Folders”)
- Recently opened local files (see “Opening Local Files Outside of Media Folders”)
- Exported files (see “Exporting”)
- Screen Recordings (see “Screen Recording”)
- Screenshots (see "Taking Screenshot").

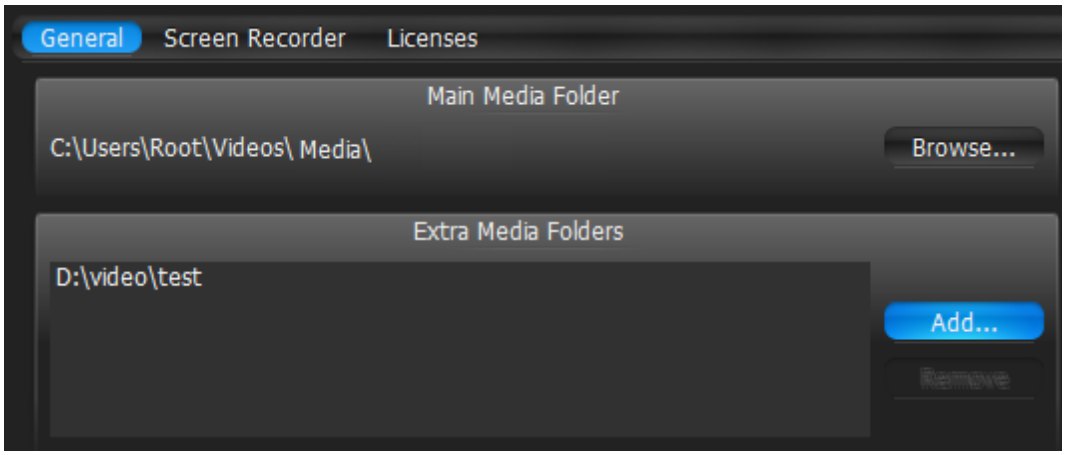
IMPORTANT. All files except the ones in media folders, are displayed in Resource Tree until Qulu is **restarted**. When saving or restoring **Layout** that contains **Items** located outside the media folders, they will get restored in Resource Tree as well.

Configuring Media Folders

When Qulu starts, it automatically indexes local media folders in order to find and display local files in Resource Tree. By default, **the current user's video folder** (C:\Users\$User\Videos) is configured as media folder.

To configure unlimited number of media folders:

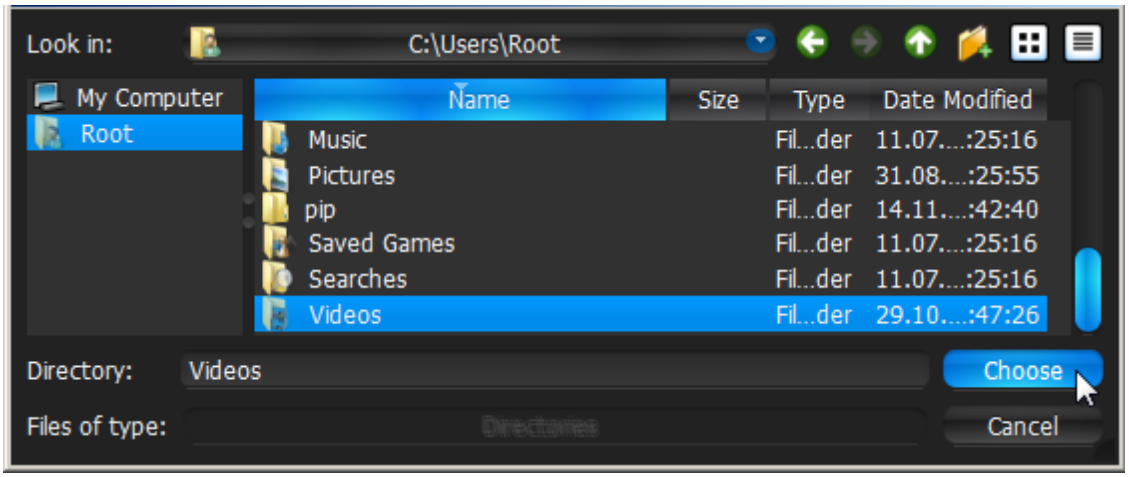
1. Open Main Menu and choose *System Settings*.
2. Go to *General.*



3. If needed to change *Main Media Folder*, click *Browse* and choose the desired path.

4. Configure *Extra Media Folders*:

   To add extra media folder click *Add…* and choose the desired path.



   It is possible to perform standard files and folders operations in this form (similar to Windows Explorer).

   To delete an extra media folder, select the folder from the list and click *Remove*.

5. Click *OK* when finished (or *Cancel* to discard changes).

As soon as media folders are configured, Qulu should be restarted. Then files from the specified media folders will be visible in Resources Tree (under the *Local* node). It is possible to place such resources in **Layouts**. Search is also available for **Local Files**.

See also "Opening Local Files Outside of Media Folders".

Opening Local Files Outside of Media Folders

It is possible to open **Local Files** outside **Media Folders** and thus are not visible in Resource Tree.

Use one of the following:

- **Drag-n-Drop one or several video files** from Windows Explorer to Qulu window
- **Drag-n-drop a folder containing video files** from Windows Explorer to Qulu window
- Open Main Menu and choose *Open –> File(s)…* (or use ***Ctrl + O***) then choose the file(s) to be opened
- Open Main Menu and choose *Open –> Folder…* then choose a folder to be opened
- Invoke Context Menu on **Scene** (on empty space) and choose *Open –> Folder…*, then choose a folder to be opened.

Any opened files will be shown in Resource Tree until Qulu is restarted. If restore **Layout** that contains **Items** located outside of **Media Folders** they will be restored in Resource Tree as well.

Navigating Through Local Files

Navigation through **Local Files** very similar to the navigation through **Camera** archive, except:

- All items are **not synchronized** (**Sync** is always disabled)
- No **Live** for **Local Files**
- **Time Line** is not colored (no recorded or motion regions).
- ⏮ and ⏭ buttons move position to the beginning or to the end of the file.

All other operations (seek, play, pause, ff/rew, etc.) are described in details in "Navigating through Archive and Live".

IMPORTANT. If **Scene** contains both **Cameras** and **Local Files**, **Cameras** are played back synchronously and **Local Files** – independently.

Forensic Analysis

Qulu provides a wide number of features for forensic analysis of recorded streams. This section explains how to perform forensic analysis in the application:

- Expanding Items to Fullscreen
- Zoom
- Rotate
- De-warping Fish-Eye Cameras
- Image Enhancement.

Expanding Items to Fullscreen

In order to perform forensic analysis, it is recommended to switch the desired **Item** to **Fullscreen**.

To toggle **Fullscreen**, proceed with one of the following:

- **Double Click** on the desired **Item** on **Scene**
- Open Context Menu and select *Maximize Item/Restore Item* (or press ***Enter***)

When in **Fullscreen** mode, all Side Panels are hidden. Use icons for panels to appear.

If several **Cameras** are displayed simultaneously, then the recorded fragments are combined on **Time Line**. If **User** switches **Item** to **Fullscreen**, only recorded fragments related to the selected **Item** are visible.

Note: it is possible to expand **Items** to **Fullscreen** sequentially (like slide-show). See "Tours" for more information.

Zoom

Zoom is extremely useful when it comes to working with **high resolution Cameras**. It is possible to **Zoom in** on single **Item** in Fullscreen or whole **Layout** if needed.

To **Zoom in/out**:

- use a **Mouse Wheel** which will only **Zoom** on the area that has a cursor over it
- use "**+**"/"**-**" keys (zoom relatively to the center of the **Scene**).

To move the zoomed Item, use either **Left** or **Right Mouse Button**. If Layout is zoomed, **Left Mouse Button** is reserved for **Item drag**. In this case, use **Right Mouse Button**.

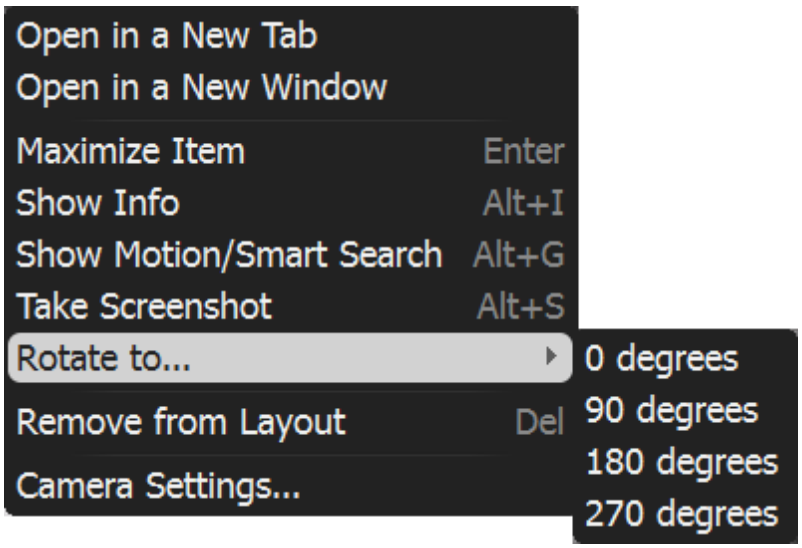
To restore the initial size of an item, use **Double Click**.

To zoom on the entire **Layout,** use ***ALT +* Mouse Wheel**

Rotate

Rotation can be performed using **Item**'s **Quick Button** ( ). Just **Click and Hold Item** and **Drag the Mouse** to rotate **Item** on **Scene**:

It is possible to use **Item**'s Context Menu (*Rotate to...*):



Finally it is possible to rotate **Item** while holding ***Alt*** (**Left Click and Drag** mouse). Release when finished.

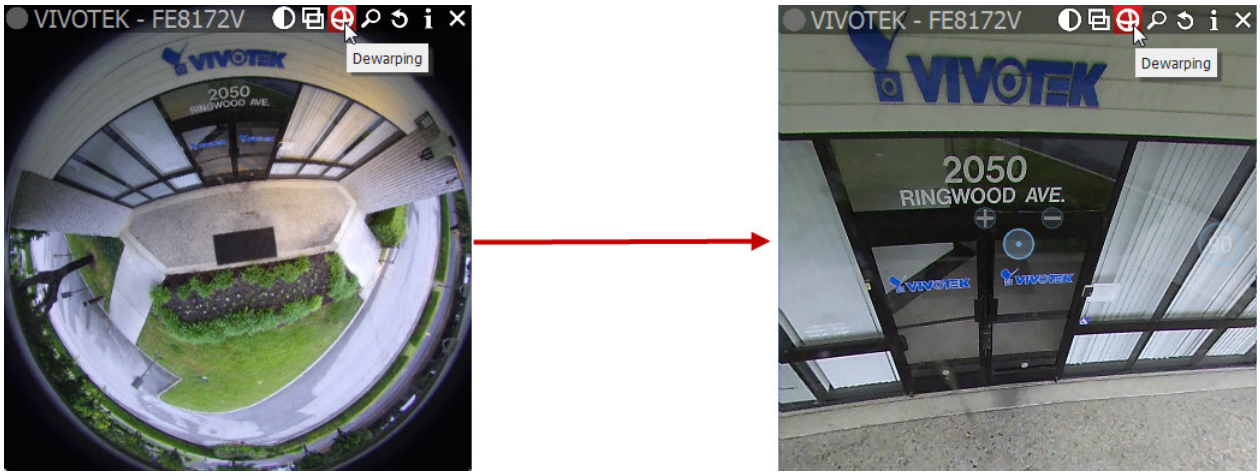
To perform **incremental rotation** (using 30 degrees step), hold ***Ctrl*** while rotating (with ***Alt*** or). Release when finished.

De-warping Fish-Eye Cameras

Qulu provides a dewarping feature to be able to view fish-eye cameras. To activate this feature on **Cameras,** dewarping must be configured for **Camera**. See "Setting Up Fish-Eye Cameras".

After all configurations are completed, the button will appear on the **Camera** Item:

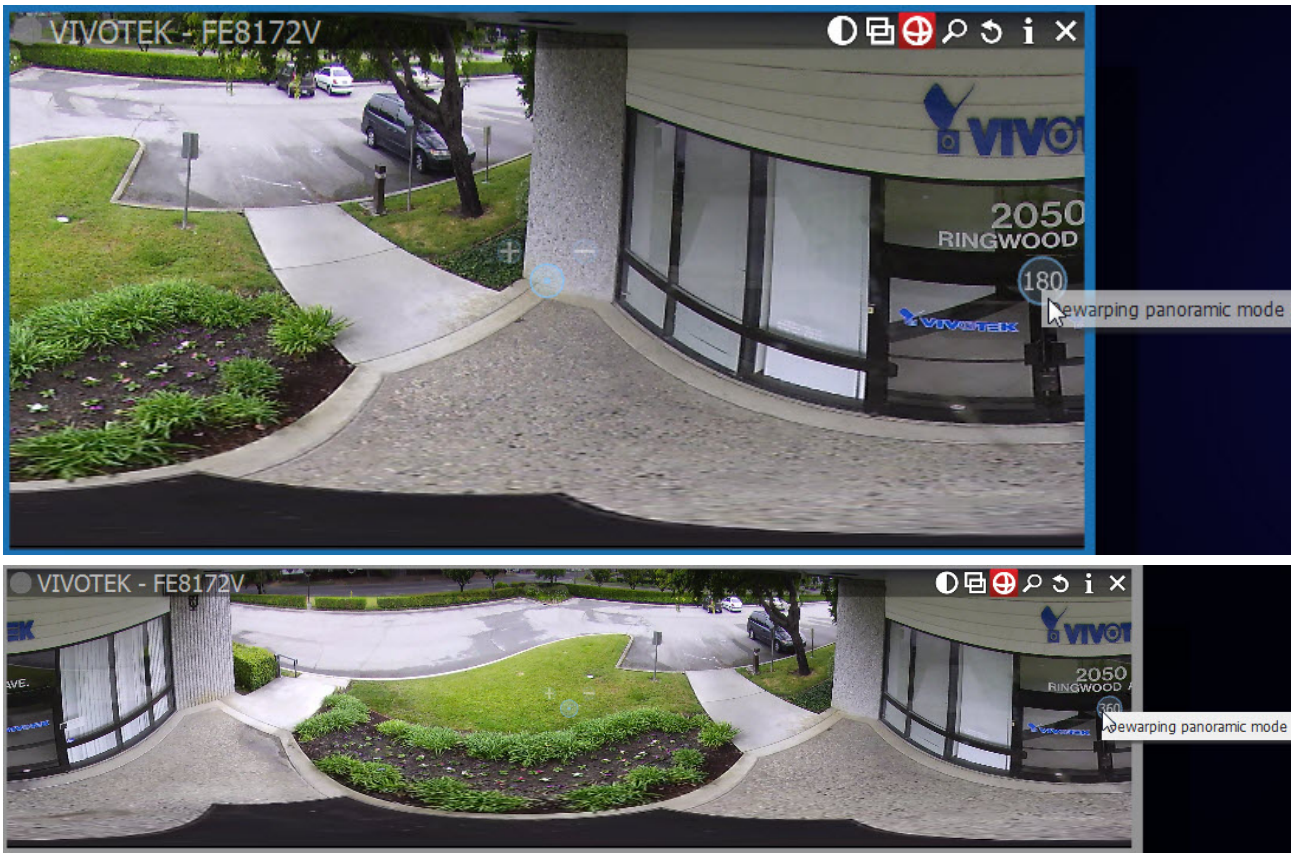
Once clicked, the button will activate dewarping and enable the following controls:



- **Left-Click** on the item, **Hold Left Mouse Button** and **move the cursor** to move **Camera** on the desired position.
- Use **+** and **-** buttons to zoom in/out
- Move to a certain position – **Left Click** on the desired position.

Qulu does not perform any dewarping when taking screenshots from FIsh-Eye Lens Cameras. However, the image can be dewarped later. See "De-warping Screenshots Taken from Fish-Eye Cameras".

It is possible to select **Dewarping Panoramic Mode** (the circle on the right). Once clicked, it will show the image as a 90, 180, or 360 degree panoramic view:



Press again to disable dewarping and hide controls.

Note: Export and Taking Screenshots features will depend on this setting as well: if dewarping is enabled, the screenshot will be dewarped automatically and the Export dialog will suggest this feature (can be disabled).

It is important to place Zoom Windows on the originally warped camera:

As displayed above, all zoom windows are dewarped automatically. Configure the zoom windows and Save Layout.

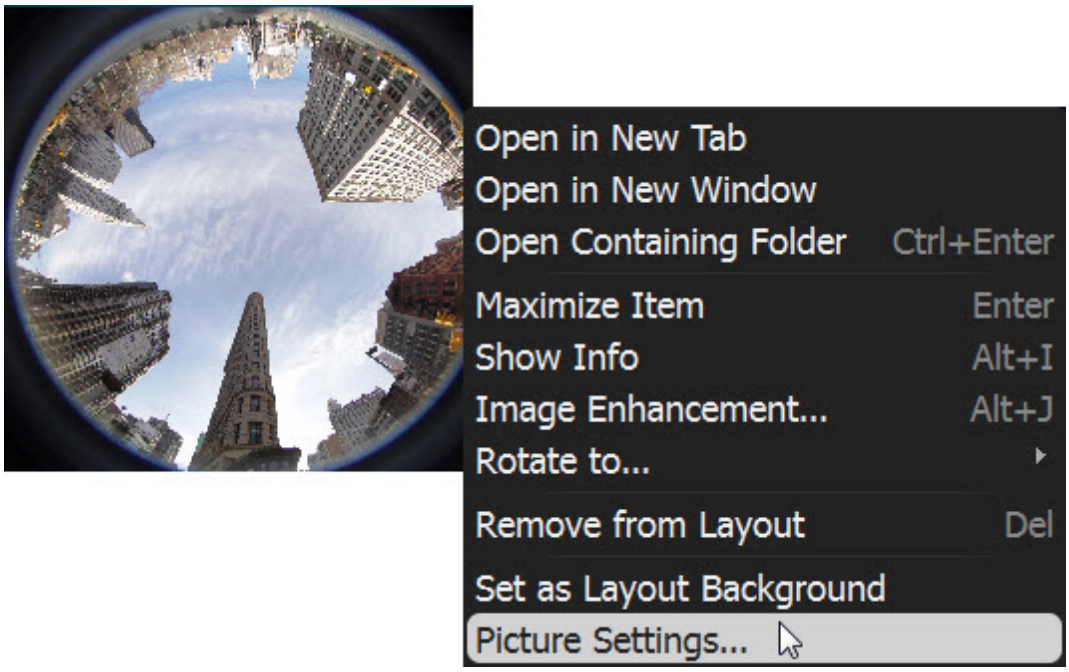
Note: this feature can be applied to images as well.

De-warping Screenshots Taken from Fish-Eye Cameras

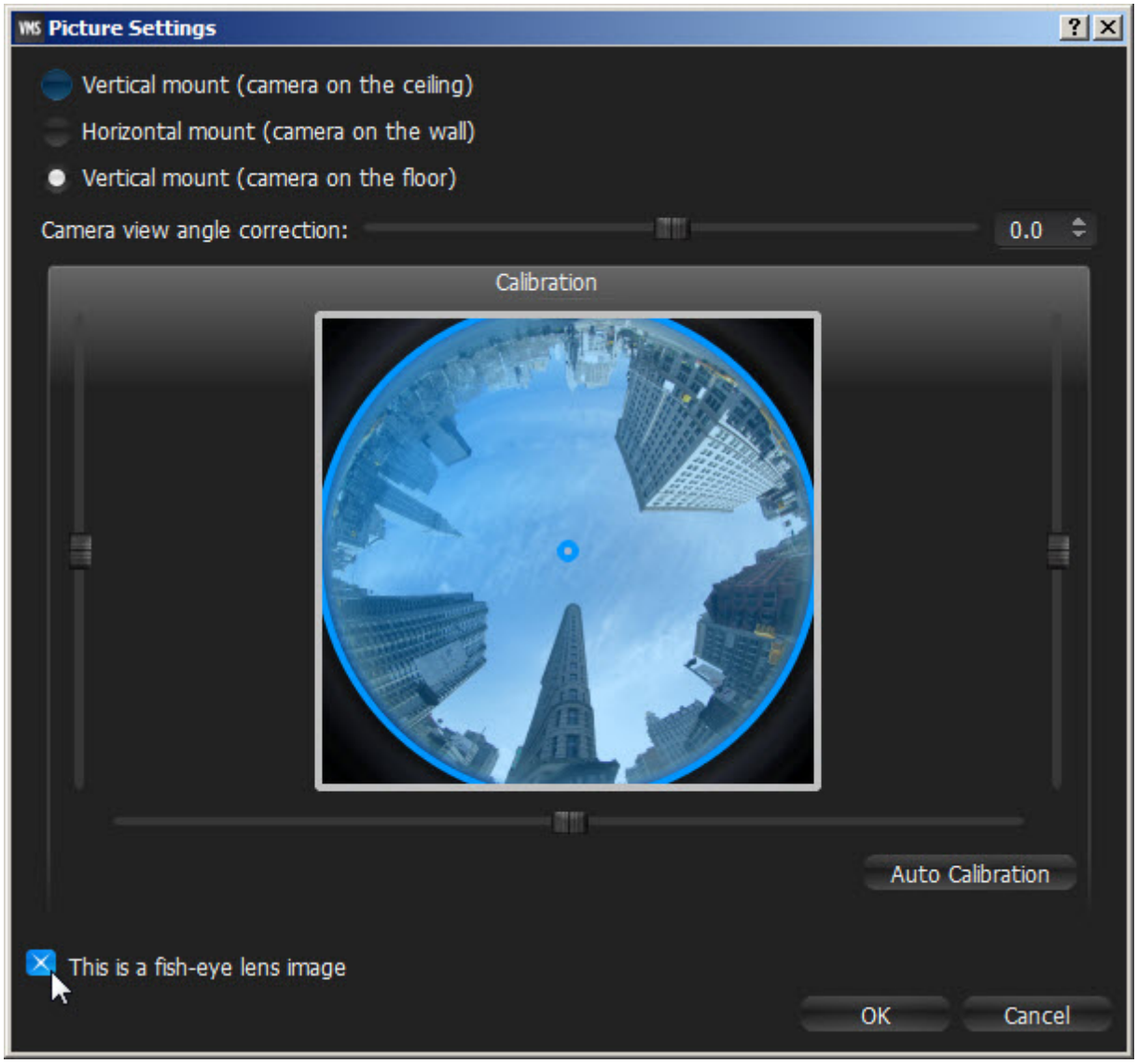
Qulu does not automatically dewarp while taking screenshots from a fish-eye camera. However, the image can be dewarped later.

To dewarp an image:

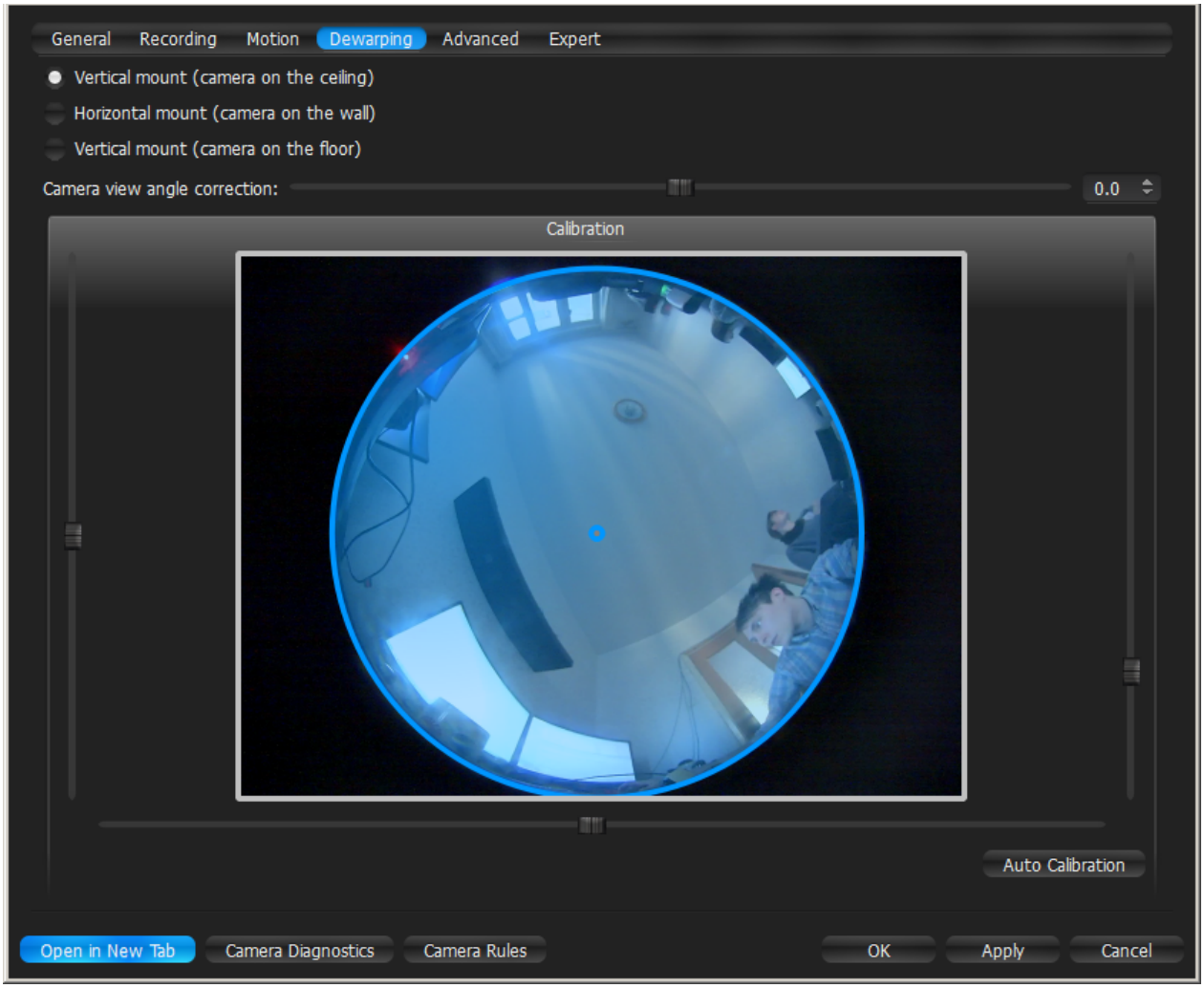
1. Right-Click on the image to open Context Menu and select *Picture Settings...*



2. Check *This is a fish-eye lens image* :



3. Set the following parameters:



- **Camera**'s orientation - type of de-warping algorithms based on orientation.
- **Calibration** - to avoid de-warping artifacts, it is important to position the calibration circle within the **Camera**'s view as accurately as possible. First, try *Auto Calibration,* then manually adjust the viewing range (if needed):
  - **Use scrollers to move the circle horizontally or vertically (or drag it with a mouse)**
  - **Use a mouse wheel to resize the circle**
- **Camera**'s view angle.

Note: It is recommended to keep image on **Scene** to monitor any image changes while adjusting settings.

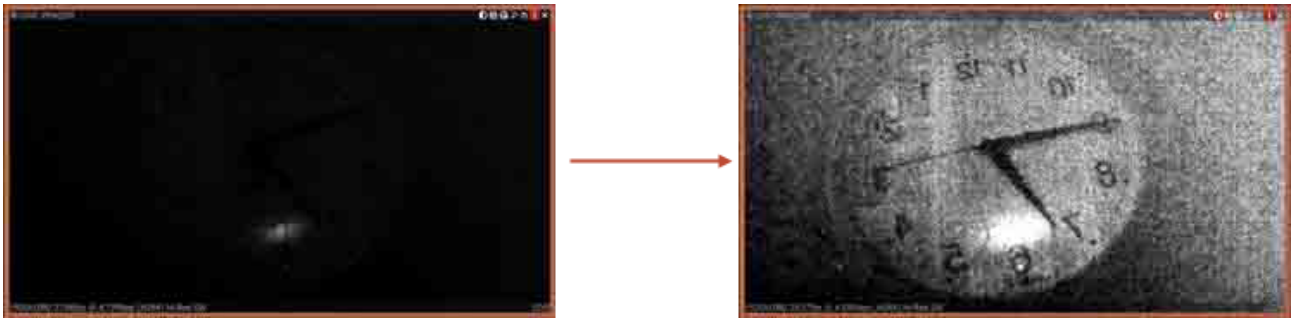
4. Click *Apply* or *OK* when finished. To discard changes, click *Cancel*.

Once a screenshot is determined to be as a fish-eye screenshot, dewarping can be performed as usual (button on the image). See "Dewarping Fish-Eye Cameras" for details.

Image Enhancement

To enhance the image on darker scenes, Qulu offers **Image Enhancement**. Not only can this feature be applied to **Cameras**, it can also enhance local files and pictures as well.

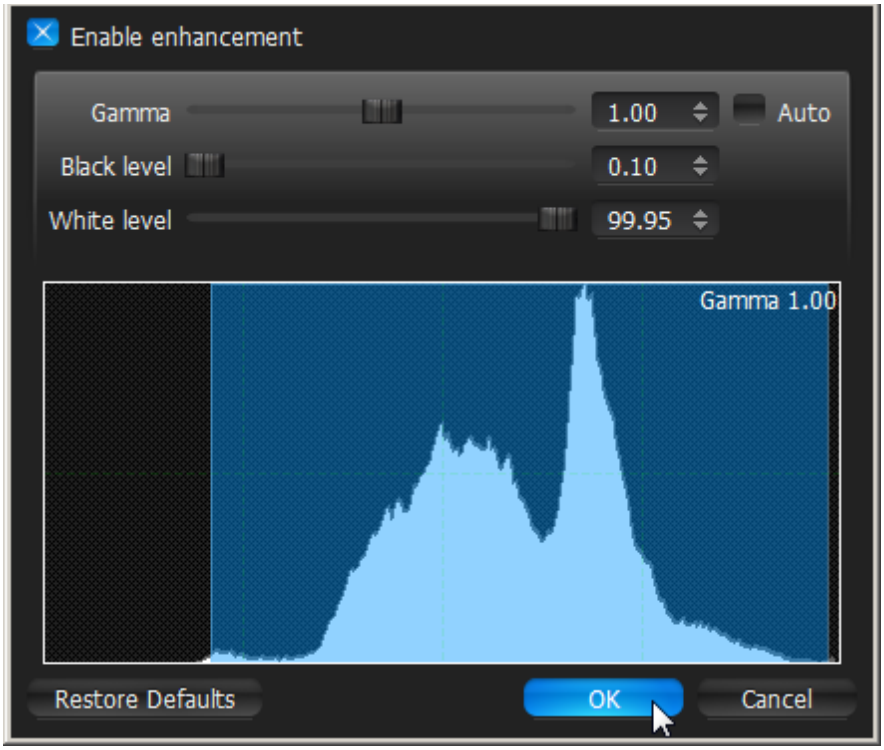
To activate **Image Enhancement**, click on the button located on the item:



Note: Export and Taking Screenshots features will depend on this setting as well: if dewarping is enabled, the screenshot will be dewarped automatically and the Export dialog will suggest this feature (can be disabled).

To adjust additional settings:

1. Invoke Context Menu and select *Image Enhancement…* (or use ***Alt + J***). The following dialog will open:



2. Click Enable enhancement and configure desired parameters:
   - *Gamma* – the lesser the value, the lighter the image will be. Set *Auto* for recommended values.
   - *Black* and *White Levels* (information is located in the Histogram section). Refrain from cutting too much of left or right areas on the histogram – this will result in losing important graphical information.
   - Click *Restore Defaults* to reset settings.
3. Click *Apply* or *OK* when finished. To discard changes, click *Cancel*.

Note: in most cases, it is not necessary to perform any additional adjustments.

Exporting

Qulu provides powerful and flexible **Export** capabilities. It is possible to perform **Export** in different formats, **Export** several videos simultaneously and perform synchronous playback of such videos, add metadata to exported videos etc.

Existing **Export** options:

- Single Camera Export. Allows exporting to AVI and MKV formats. Adds time stamps to exported video (start and end time).
- Multi-Video Export. Allows exporting to proprietary format (should be played by Qulu) as well as executable bundle (can be viewed on every WIndows computer). Export is performed with additional metadata (time stamps, recorded fragments data, motion etc).
- Checking the Validity of Exported Videos
- Taking Screenshots.

Note: **Export** are available to **Administrators** and **Viewers** that have appropriate permissions.

Single Camera Export

This section provides detailed information on how to export video from a single **Camera**'s archive or **Local Video File**:

- Exporting Recorded Region from a Single Camera
- Viewing Videos Exported from a Single Camera

See the "Multi-Video Export" section for more information on exporting video from several **Cameras** or **Local Files** simultaneously.

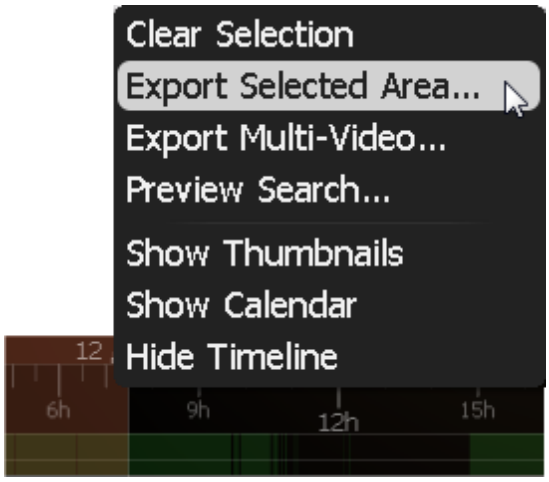
Exporting Recorded Region from Single Camera

Qulu supports **Export** in two media formats: Matroska (**mkv**) and **avi**. These formats are supported by most players (additional codecs may be required for playback).

Export can also be done for **Local Video Files**.

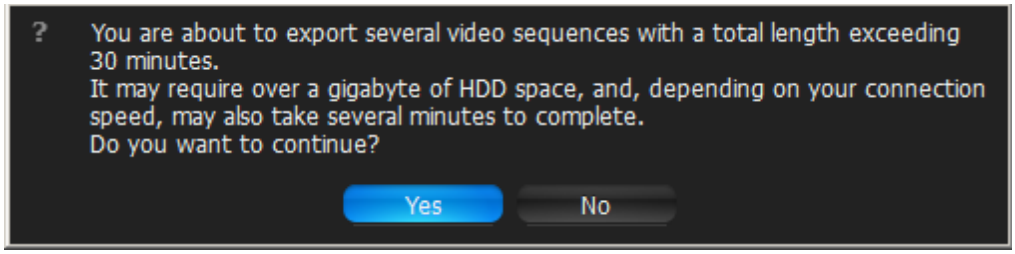
To **Export**:

1. Select the desired **Item** on **Scene** (**Camera** or **Local Video File**).
2. Select the region to export on **Time Scale**:
   - Use **Right Click Drag**
   - Open Context Menu on **Time Scale** and click *Mark Selection Start* (or press "***[***"), then *Mark Selection End* (or press "***]***")
   - To clear selection, use the corresponding Context Menu item
   - Adjust the region to export by dragging edges
   - To make zooming easier, zoom **Time Line** using a **Mouse Wheel**
3. Invoke Context Menu and choose *Export Selected Range*:



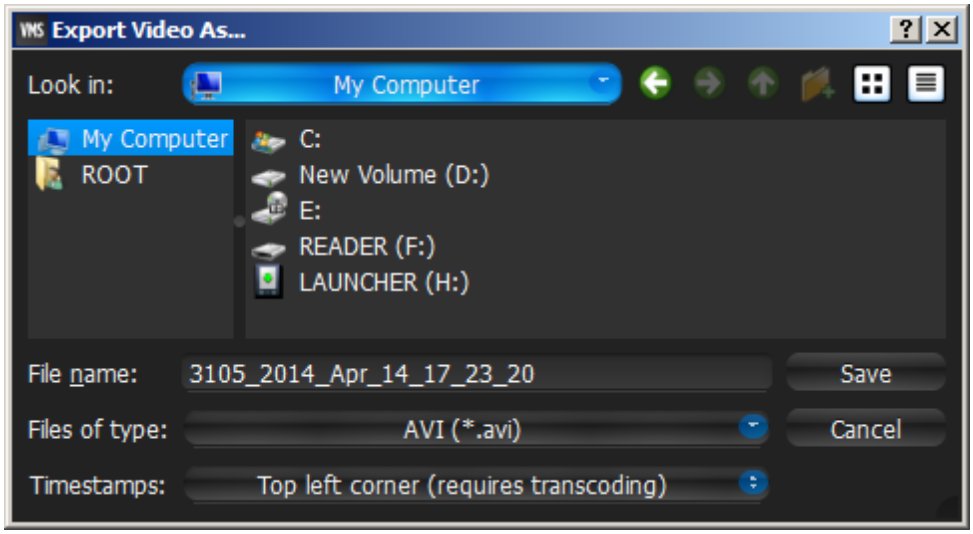
If the selection does not contain archive data, this feature is not available. If the selection starts with empty archive (see the screenshot above), the exported footage will start from the first available frame (empty archive will not be exported). If the selection contains empty archive in the middle, it will still be exported and not show when viewing the exported footage.

IMPORTANT. If a long period of time is selected for export, export may be slightly delayed. In this case, the following warning will appear:


You are about to export several video sequences with a total length exceeding 30 minutes.
It may require over a gigabyte of HDD space, and, depending on your connection speed, may also take several minutes to complete.
Do you want to continue?
Yes
No

In this case, it is possible to continue working with Qulu while exporting.

4. Choose the desired **file name**, **format** and **location** and click *Save* (*Cancel* will close the dialog and no exported data will be saved):



IMPORTANT. If Image Enhancement, Forcing Aspect Ratio or De-warping were applied to the exported source, it will be suggested to the user to keep these settings (may be disabled if needed). Additionally, it is also possible to render date and time on the video (*Timestamps* dropdown list). However, these settings will require **transcoding** on client, so **may take a longer period of time with slightly decreased quality and increased processor load up to 100% during export**. These settings are not applied for the **EXE** format.

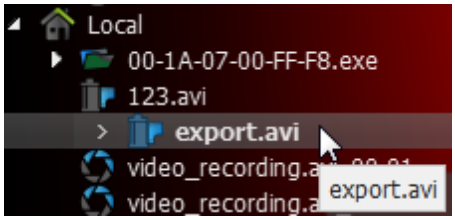
File and folder operations are performed in the same manner as in Windows Explorer.

The following formats are supported:

- **AVI** is more widely used, but the codec remains intact (H264). To view exported videos in other players may require additional codecs. Additionally some codecs are not allowed in **AVI** format. A warning message will appear. This is a default format.
- **MKV** is a more advanced format, but may not be played back on some devices (ex: home media players). It does not restrict video and audio content.
- **EXE** is used for distributing videos to the users who do not have any codecs or media players installed. As soon as this executable is started, new **Client** instance is run and plays back the exported video. In this case, **the data on motion and recorded fragments is also exported**.

IMPORTANT. Files produced with the **x64** version of software will only be viewable on Windows **x64**; however, **x86** can be viewed on any architecture.

As soon as export is finished, the video will be available in *Local Files* in Resource Tree:

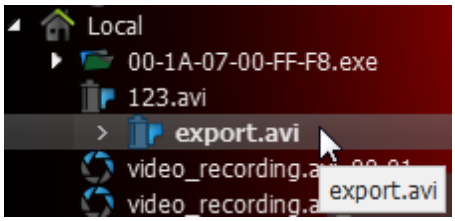


IMPORTANT. This resource will be available **until Client restarts**. To make it available permanently, save the exported video to Qulu **Media Folder** (see "Configuring Media Folders") or create and save a **Layout** that would contain this video.

Also, see the "Viewing Videos Exported from a Single Camera" section for more information.

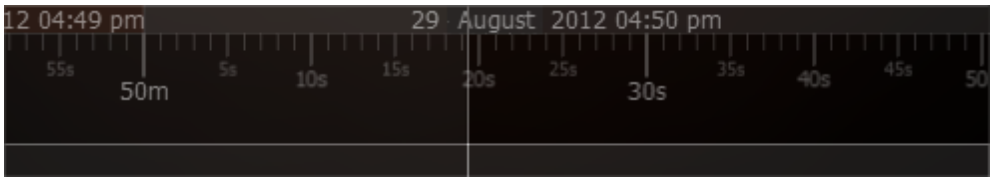
Viewing Videos Exported from Single Camera

As soon as export is finished, the extracted video clip will be available in *Local Files* in Resource Tree. Note that **AVI** and **MKV** files are shown as a single record and **EXE** file - as **Folder** containing exported **Camera**:



It is possible to open either an **EXE** file (it will be displayed in new **Tab)** or open a camera - it will be displayed as single **Item**.

When the exported file is opened, **Time Line** will display the exported time range:



If **EXE** bundle is opened, then the recorded fragments and motion will be displayed on the Time Line as well:

Note: start and end time points **differ from a regular Local File**. It is the start and end time of the **exported fragment**. When viewing information, the time will be displayed in **Item**'s bottom right corner.

Multi-Video Export

This section provides detailed information on how to export video from a single **Camera**'s archive or **Local Video File**:

- Exporting the Layout in Multi-Video Format
- Viewing Multi-Videos
- Changing Multi-Videos after Export.

Also, see the "Single Camera Export" section for information on exporting video from a single **Camera** or **Local File**.

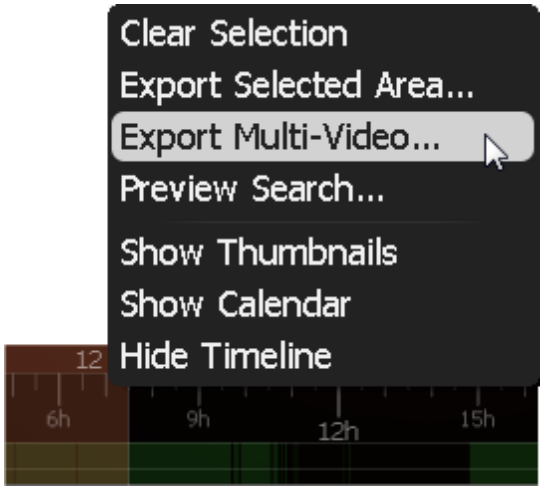
Exporting Layout in Multi-Video Format

Qulu provides a powerful feature to perform **Export** in a proprietary format, which has many benefits in comparison to standard **Export** (see "Exporting Recorded Region from Camera"):

- It is possible to **export several videos simultaneously** (for instance, it is possible to export the last hour of recording from five cameras). The exported files are saved as regular **Layout** and can be opened in Qulu. The exported **Multi-Video** can be navigated through as any other layout (see "Navigating through several cameras synchronously"), perform Smart Motion Search, etc. It is possible even do **Multi-Video Export** from Multi-Video.
- It is possible to export additional information (recorded chunks and motion).
- It is possible to prepare a bundled version that can be run and viewed on clean **Windows** systems.

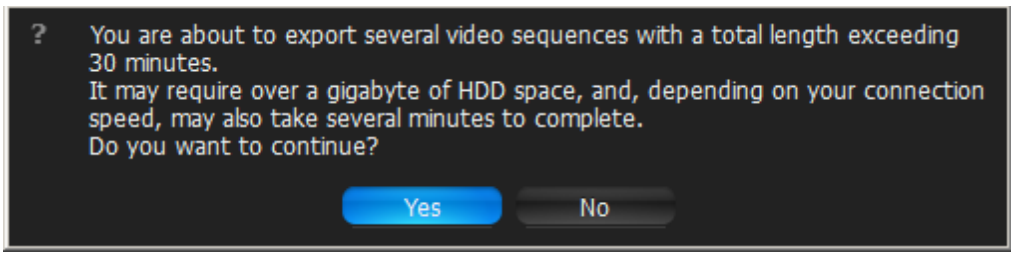
To do **Export in proprietary format**:

1. Place the desired **Items** on **Scene.** A user cannot export **Local Video Files** into **Multi-Videos**, but cannot mix the two.
2. Select the export region on **Time Scale**:
   - Use **Right Click Drag**
   - Open Context Menu on **Time Scale** and click *Mark Selection Start* (or press "***[***"), then *Mark Selection End* (or press "***]***")
   - To clear selection, use the corresponding Context Menu item
   - Adjust the export region by dragging edges
   - For easier zoom, scroll the **Mouse Wheel** on **Time Line.**
3. Open Context Menu and choose *Export Multi-Video*:



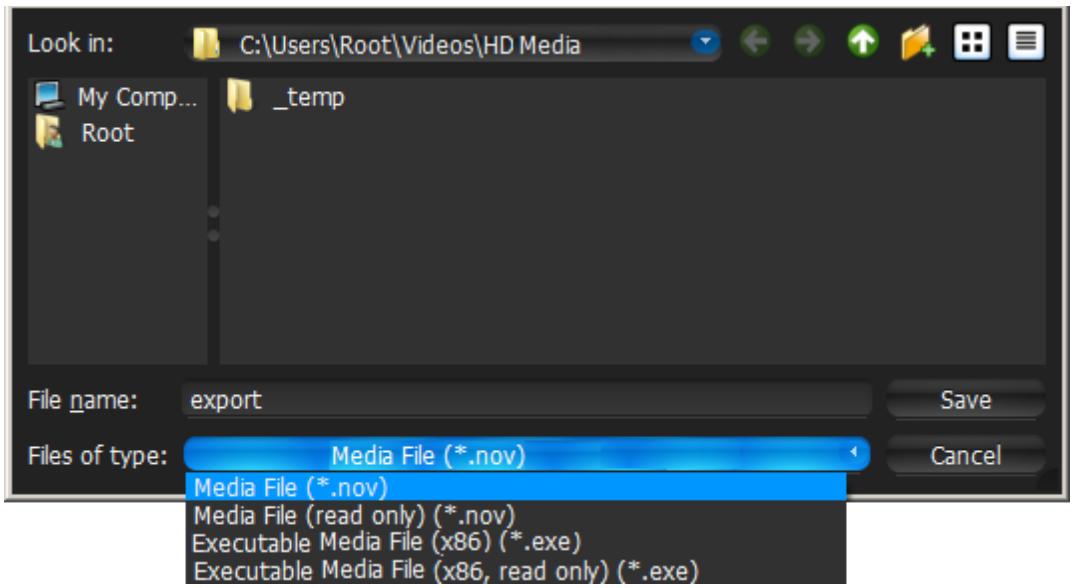
If the selection contains empty archive on **Camera,** it will be exported and **NO DATA** will be shown when viewing the exported clip.

IMPORTANT. If a long period of time is selected for export, it may cause delays. In this case, the following warning message will appear:


You are about to export several video sequences with a total length exceeding 30 minutes.
It may require over a gigabyte of HDD space, and, depending on your connection speed, may also take several minutes to complete.
Do you want to continue?
Yes
No

In this case, it is possible to continue working with Qulu while exporting.

4. Choose the desired **file name**, **format** and **location** and click *Save* (*Cancel* will close the dialog and no exported data will be saved):



File and folder operations are performed in the same manner as in Windows Explorer.

The following formats are supported:

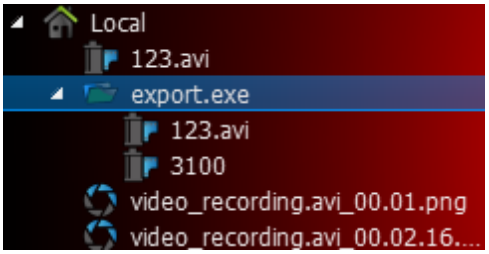
- **NOV** – a proprietary format. Can be opened by Qulu Client only. Can be changed if needed (see "Changing Multi-Video after Export").
- **NOV (Read-Only)** – a proprietary format. Should be opened by Qulu. Cannot be changed.
- **EXE** – an executable bundle (platform dependent – **x86** or **x64**). Can be opened without Qulu installed on the computer. Can be changed in the future if needed (see "Changing Multi-Video after Export").
- **EXE (Read-Only)** – a proprietary format (platform dependent – x86 or x64). An executable bundle. Can be opened without Qulu installed on the computer. Should be opened by Qulu. Cannot be changed.

  EXE is used for distributing videos to the users who do not have any codecs or media players installed. As soon as the bundle is started, the **Client** is run and it plays back the exported video. In this case, the **data on motion and recorded fragments is also exported**.

IMPORTANT. Files produced with the **x64** version of software will only be viewable on Windows **x64**;

however, **x86** can be viewed on any architecture.

As soon as export is finished, **Multi-Video** will be available in local files:

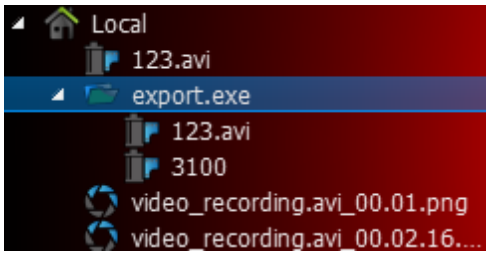


The following operations can be performed:

- View videos (see "Viewing Multi-Videos") as **Layouts**
- View single **Items** from the videos
- Edit **Multi-Videos** if not read-only (see "Changing Multi-Video after Export").

Viewing Multi-Videos

After performing **Multi-Video Export**, the exported file is displayed in local files as follows:



The following operations can be performed:

- View a single camera from Multi-Video. Perform actions described in "Adding Items to Layouts".
- Open entire **Multi-Video**. It will be opened as a regular **Layout** on a separate **Tab**. Perform actions described in "Opening and Closing Saved Layouts".
- Delete items from Multi-Video. See "Changing Multi-Video after Export".

When **Multi-Video** is opened, the following standard features can be performed:

- Navigation through archive
- Thumbnail Navigation
- Preview Search
- Smart Motion Search
- Calendar Search
- Tours
- Screenshots
- Single Camera Export
- Export (incl. Multi-Video Export)
- Checking the Validity of Exported Videos
- Layout Reconfiguration
- Forensic Analysis.

Any capabilities possible with **Cameras** can also be performed with **Multi-Videos** in Qulu.

Changing Multi-Videos after Export

Qulu offers many possibilities when working with **Multi-Videos**. A user can do almost everything as with regular **Layout**:

- Add or remove **Items**. For instance, if **Multi-Video** was exported from **10PM** to **11PM** and a new camera was added, it would get synchronized with other cameras and be displaying in the same archive (**10PM – 11PM**). See "Adding Items to Layouts" and "Removing Item(s) from Layouts".

  Note: Local Files are not allowed in Multi-Videos

- Adjusting **Layout Look and Feel** (move, swap, resize, rotate). See "Adjusting Layout's Appearance".
- Save modified **Multi-Video**. One restriction is applied: it is not possible to mix **Local Videos** and **Cameras** in a single **Multi-Video**. Same as **Layouts** (see "Saving Layouts"), but can be performed by **Viewers**.

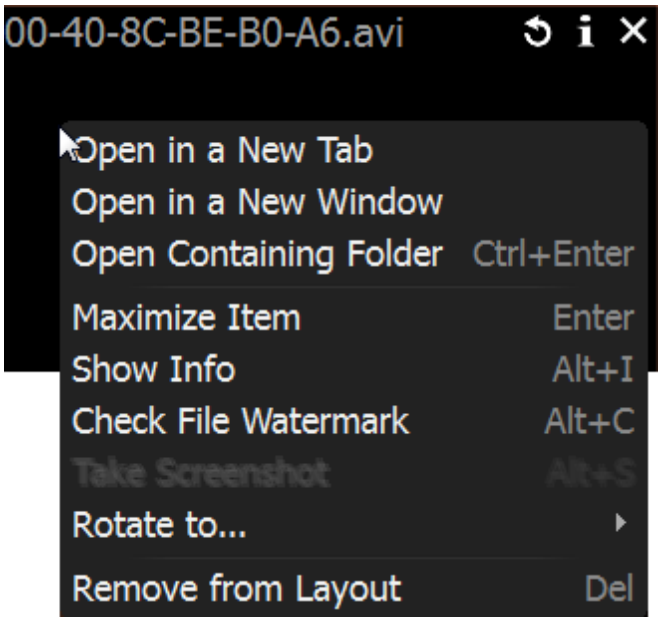
  Note: **Multi-Video** can be saved with a read-only flag (modifications will not be saved).

Checking the Validity of Exported Videos

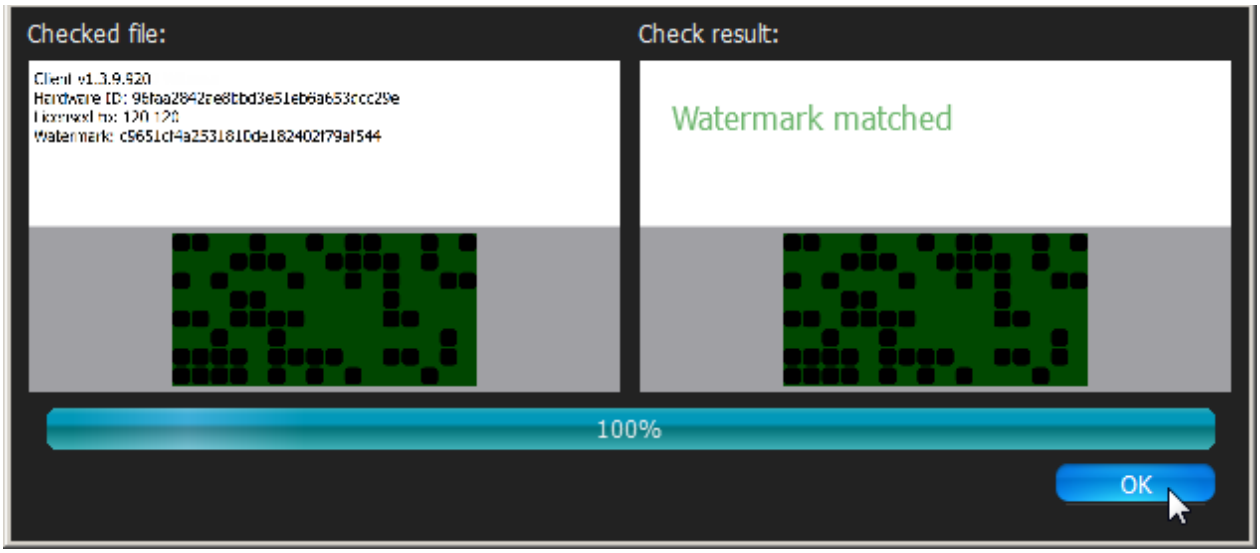
Watermark allows **Users** to check for validity of footage to determine whether or not any modifications were ever performed to the native footage. Any videos exported by Qulu (either single **Cameras** or **Multi-Videos**) can be checked for validity.

To check the validity of exported videos:

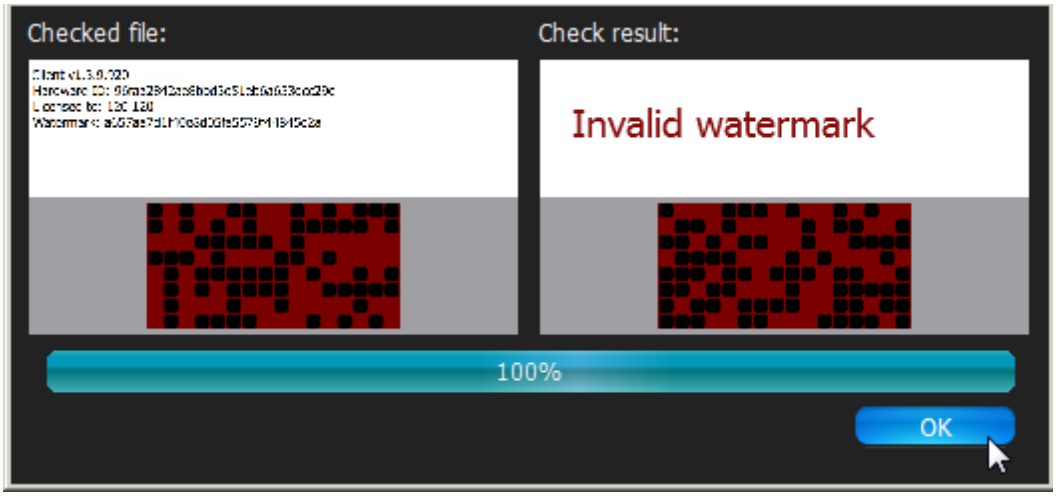
1. Bring the desired video onto the scene
2. Open Context Menu and select *Check File Watermark* (or press ***Alt + C***)



3. If the file is in its original state, the check will succeed:



4. If any modifications took place, the check will fail:



Taking Screenshots

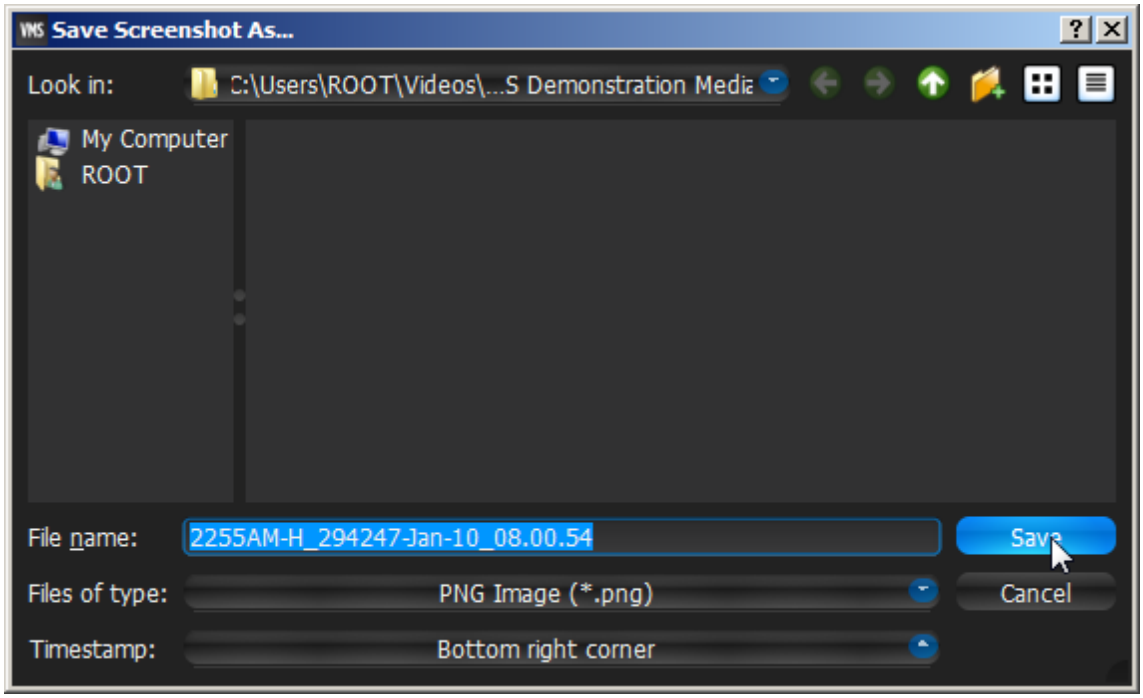
Screenshot can be taken from both **Cameras** and **Local Video Files** to **PNG** or **JPG** output formats.

IMPORTANT. If Image Enhancement and/or De-warping capabilities were initially applied to the exported source, they will be retained while rendering the screenshot.

To take **Screenshot** from a video:

1. Select the desired **Item** on **Scene**.
2. Seek to the desired position (frame seek will help). See "Navigating through Archive and Live".
3. Click the button on the item.
4. Choose the desired file name and location and click *Save* (*Cancel* will close the dialog and data will not be saved):

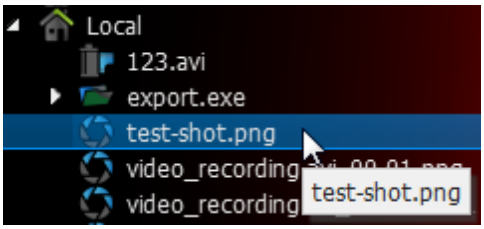
   Note: check *Include Timestamp* to insert playback time in the screenshot (enabled by default).



   It is possible to place timestamps on screenshots (use *Timestamps* dropdown list).

File and folder operations are performed in the same manner as in Windows Explorer.

Once saved, **Screenshot** will be available in **Local Files** within Resource Tree:



IMPORTANT. This resource will be available **until Client restarts**. To make it available permanently, save the exported video in the Qulu **Media Folder** (see "Configuring Media Folders") or create and save a **Layout** that would contain this video.

Adjusting Volume

To adjust **Volume**, use one of the following:

- Use **Volume Slider** (at the right of the **Time Line**)
- Use a **Mouse Wheel** above the slider
- Use ***Ctrl + Up/Down***
- Use button or use "***P***" key to mute/unmute.

IMPORTANT. The volume level will affect the following system Actions: Speak, Play Sound and Repeat Sound. Note: notifications will not be heard if on mute.

Tours

If several **Items** are opened on **Scene**, this feature will provide the ability to automatically switch to the next **Item** in a Fullscreen mode (like **slide show**). To start **Tour**:

1. Select several **Items** (see "Adding Items to Layouts")
2. Open Context Menu and select *Start Tour* (or press ***Alt+T***)

To stop **Tour**, **Double-Click** or press any key.

To change sequence speed (the frequency in between **Items** during **Tour**):

1. Open Main Menu and go to *System Settings*
2. Specify the desired delay (in seconds) in *Sequence Cycle Time.*

Screen Recording (Windows Only)

This is an extremely useful feature in Qulu for presentations. It is possible to record from several displays with sound, select different quality, etc.

Screen can be recorded in the following formats:

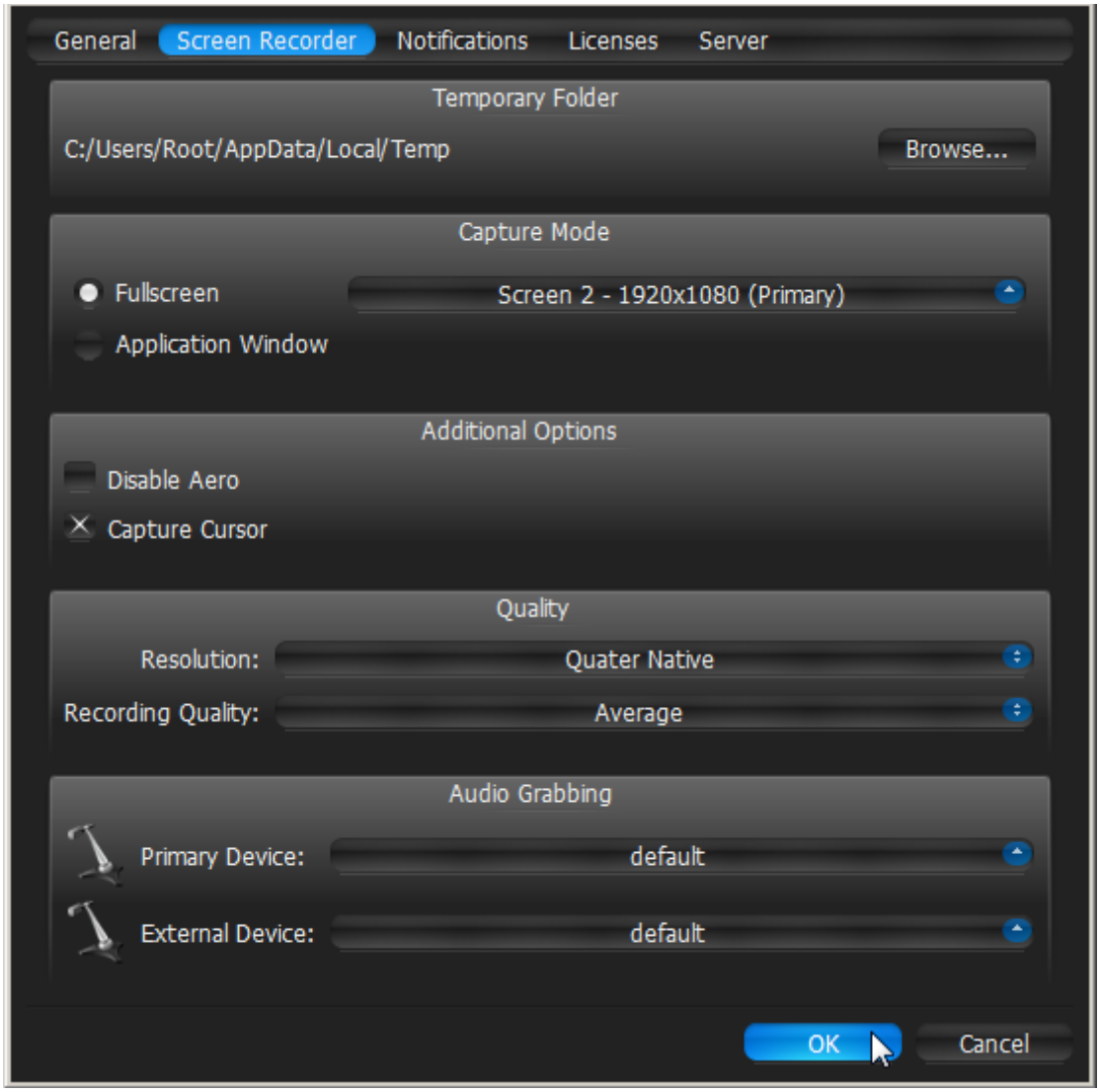
- Video: **MPEG4 Part 2**
- Audio: Stereo (**Lame Audio Codec**)
- Container: **AVI**

IMPORTANT. It is necessary to have a powerful processor and video adapter to do screen recording. See recommended configuration in the installation guide.

Setting up Screen Recording

To set up **Screen Recording**:

1. Open **Main Menu** and choose *System Settings*.
2. Go to the *Screen Recording* tab.
3. Configure **Screen Recording** parameters:



- *Temporary Folder* – the folder that stores temporary files. FIles are stored during recording, then are copied to a specified folder to be saved.

IMPORTANT. This folder should be accessible and writable.

- *Capture Mode*: *Fullscreen* (if several monitors are installed the desired one should be chosen) or *Application Window* (only Qulu window will be recorded).
- *Disable Aero* – select this option to enhance performance. If chosen, once **Screen Recording** is in progress, **Windows Aero** will be turned off.
- *Capture Cursor* – select this checkbox if a mouse cursor needs to be visible during recording.
- *Resolution* – select screen resolution. The lower the resolution, the higher the performance.
- *Encoder Quality* – select *Performance* for best performance. Select *Best* for best quality.
- *Primary* and *Secondary device* – select sound devices to enable audio. Audio will get mixed from both devices. The best practice is to select master from the sound card as primary and microphone as secondary. In this case, both sounds from Qulu (i.e. video clips) and microphone will be recorded simultaneously.

4. Click *OK* when done or *Cancel* to discard changes.

Performing Screen Recording

To run **Screen Recording,** proceed with one of the following:

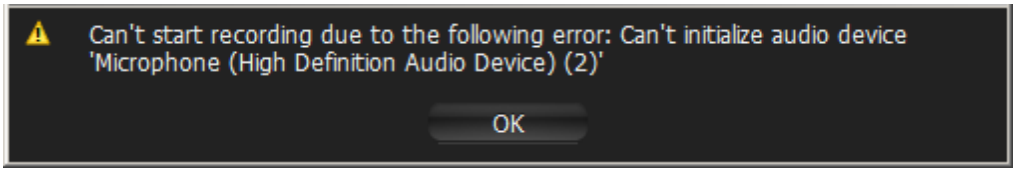
- Open Main Menu and select *Start Screen Recording* (or press ***Alt + R***)
- Click on the icon in the top right corner.

Screen recording will start in 3 seconds.

When finished, proceed with one of the following:

- Open Main Menu and select *Stop Screen Recording* (or press ***Alt + R***)
- Click on the icon again in the top right corner.

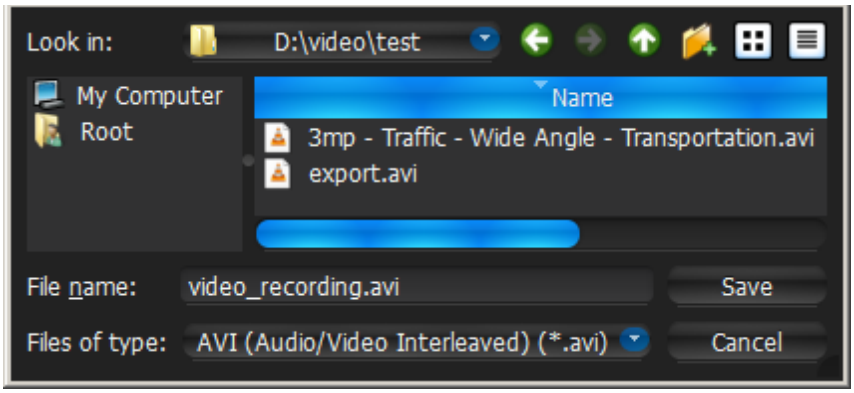
IMPORTANT. If audio parameters are setup incorrectly, **Screen Recording** will display the following error:


Can't start recording due to the following error: Can't initialize audio device 'Microphone (High Definition Audio Device) (2)'
OK

In this case it is necessary to do the following:

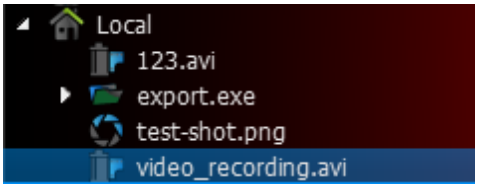
1. Set up audio card parameters in Windows, check and select default recording devices. Then try to record sound in Windows Recorder.
2. Set up Screen Recorder Parameters (see "Setting up Screen Recording").

Choose the desired file name and location and click *Save* (*Cancel* will close the dialog and data will not be saved):



File and folder operations are performed in the same manner as in Windows Explorer.

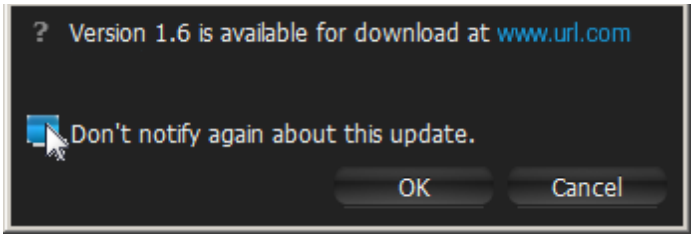
As soon as the file is saved, it will be available in local files:



IMPORTANT. This resource will be available **until Client restarts**. To make it available permanently, save the exported video to Qulu **Media Folder** (see "Configuring Media Folders") or create and save a **Layout** that would contain this video.

Upgrading Qulu

Qulu offers automatic upgrades. Whenever a new version is released the following notification will appear:



To avoid further notifications, check *Don't notify again about this update.*

If the notifications have been disabled, it is possible to check for update manually. To do so, open Main Menu and click on *Check for Updates...*

Troubleshooting and Contacting Support

The following issues can be resolved manually:

- If **Camera** is not working properly, a user should always diagnose it. See "Diagnosing Offline Cameras" for more information.
- If archive is lost, Qulu will restore it. See "Restoring Broken Archive" for details.

To contact support, use the following link: support@vista-cctv.com

When posting an issue, it is necessary to describe the problem as detailed as possible. It is useful to provide additional information such as log files, network configuration, etc. If possible please provide administrator login credentials as well.

To expedite investigation, it's best to Provide Remote Access. If remote access cannot be provided for security reasons, the following steps should be taken in creating a support ticket:

- Recording Issue
- Collecting Logs
- Collecting Additional Information.

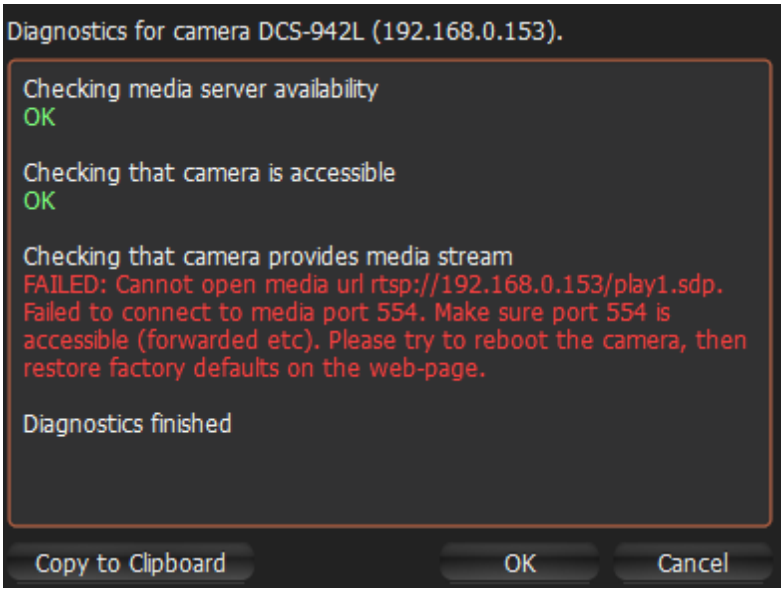
Diagnosing Offline Cameras

Sometimes cameras are displayed in Resource Tree, but are marked with a sign. When opening such camera, it will display **NO SIGNAL.** Qulu will then prompt the user to perform more thorough diagnostics.

IMPORTANT. Run diagnostics prior to contacting support.

Diagnostics can be invoked by pressing on the item:

Once complete, reasons and recommended actions will be displayed:


Diagnostics for camera DCS-942L (192.168.0.153).
Checking media server availability
OK
Checking that camera is accessible
OK
Checking that camera provides media stream
FAILED: Cannot open media url rtsp://192.168.0.153/play1.sdp. Failed to connect to media port 554. Make sure port 554 is accessible (forwarded etc). Please try to reboot the camera, then restore factory defaults on the web-page.
Diagnostics finished
Copy to Clipboard
OK
Cancel

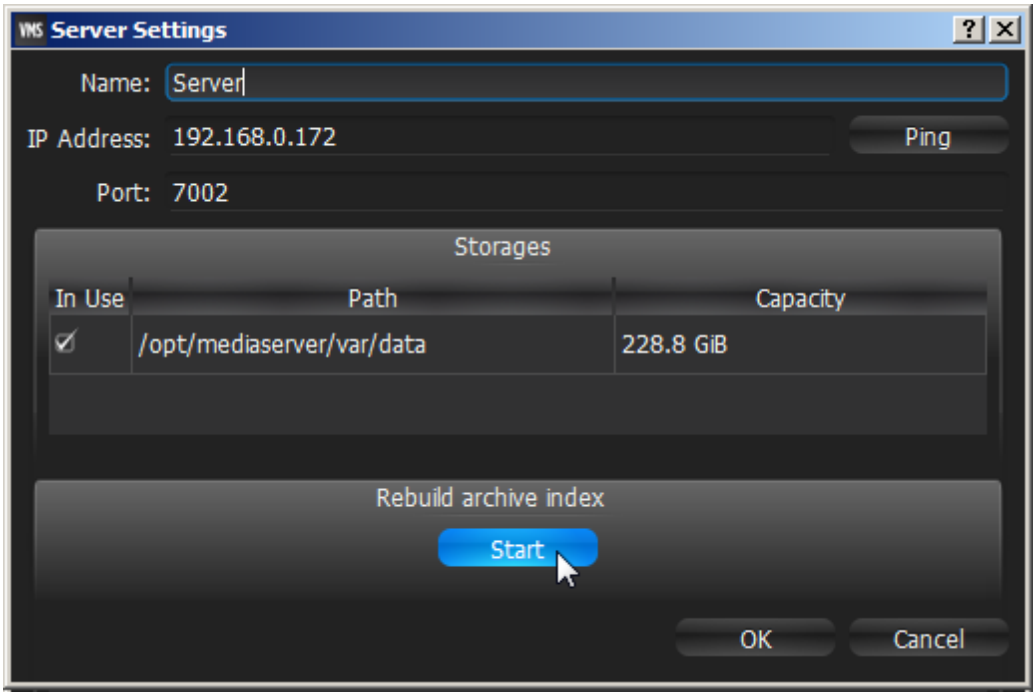
Follow instructions to resolve the issue. If unsuccessful, contact support (see "Troubleshooting and Contacting Support"). Click *Copy to Clipboard* and paste the data into the message prior to sending it to support.

Restoring Broken Archive

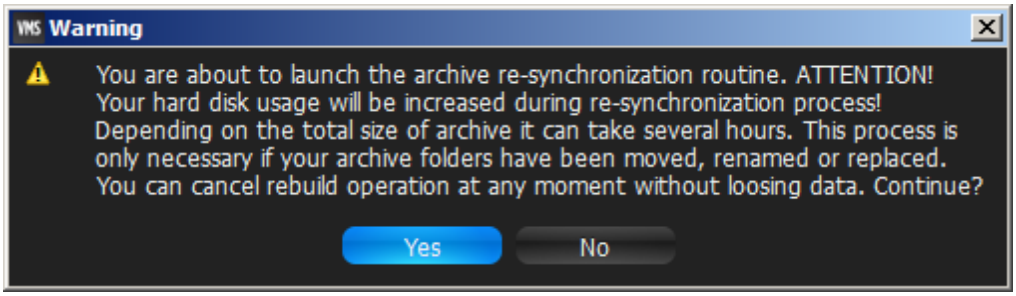
Qulu uses a specific directory on each network drive. However, sometimes archive is moved for various reasons (ex, a hard drive was replaced, hard drive's letter was changed. etc), possibly resulting in a complete removal of archive from the system.

Qulu can easily restore the lost archive. To perform archive restoration:

1. Open the Server Settings.
2. Click on *Rebuild Archive Index*.



3. The process can take a long time. Click *Yes* to proceed.


Warning
You are about to launch the archive re-synchronization routine. ATTENTION!
Your hard disk usage will be increased during re-synchronization process!
Depending on the total size of archive it can take several hours. This process is
only necessary if your archive folders have been moved, renamed or replaced.
You can cancel rebuild operation at any moment without loosing data. Continue?
Yes
No

Restoration can be canceled in any moment.

If the window is closed, the restoration will continue running in the background.

The system can continue recording while the archive is being restored.

Providing Remote Access

The best possible way to help investigate an issue is to provide remote access via one of the following applications:

- **Team Viewer** (http://www.teamviewer.com)
- **Citrix GoTo Meeting** (https://www.citrix.com/products/gotomeeting/overview.html)
- **VNC**: RealVNC (https://www.realvnc.com/), TightVNC (http://www.tightvnc.com/), UltraVNC (http://www.uvnc.com/)
- **RDP** (Windows Remote Desktop). Requires **Public IP**.

For Linux Mac it is possible to open SSH access. Requires **Public IP**.

Finally **Public IP** is necessary for the following investigations:

- Ability to connect remotely to the system and debug issue on the client side (EC should be accessible via Internet)
- Camera issues investigations. For this purpose Camera should be accessible via Internet by **Public IP**.

Recording Issue

If it is not possible to provide remote access for security reasons, a supporting video clip can help understand and investigate the issue. To create a video clip:

1. Set up **Screen Recording**: select desired screen and microphone settings (see "Setting up Screen Recording").
2. Record a narrated (preferred) video explaining the issue (see "Performing Screen Recording").
3. Attach the video to the support ticket.

Collecting Logs

The following logs must be provided as part of a support ticket:

- System Logs
- Media Server Logs
- Client Logs.

To obtain System Logs:

1. Open Event Log form (see "Viewing Events Log").
2. Choose **<Any Event>**, **<Any Camera>**, **<Write To Log>** filters.
3. Open Context Menu and choose *Select All* (or press ***Ctrl+A***).
4. Open Context Menu and choose *Export Selection to Flie.*
5. Save the file and attach to the support ticket.

To obtain Media Server Logs:

1. Right click on the desired Media Server, open Context Menu and choose *Server Logs...*. The log will open up in browser.
2. Copy all text (***CTRL+A***) and paste it into a new text file.
3. Repeat this for all Media Servers (if necessary).
4. Save the file and attach to the support ticket.

To obtain Client Logs:

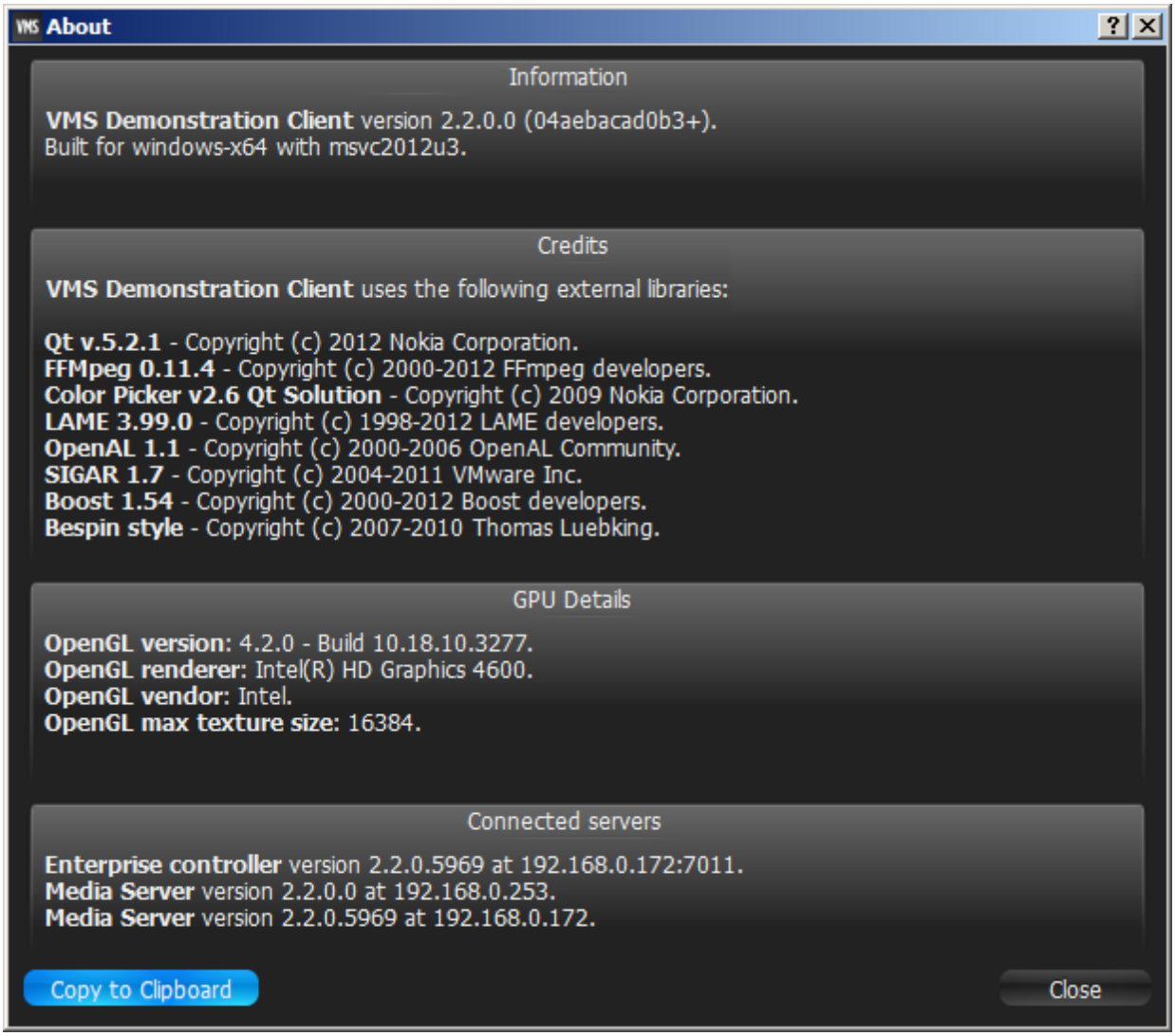
1. Open Main Menu, go to *System Settings...* -> *General* tab.
2. Right click on the desired Media Server, open Context Menu and choose *Server Logs...*. The log will open up in browser.
3. Click *Browse Logs* in *Misc* section. Log file (**log_file.log)** will open in **Explorer**.
4. Copy the file and attach to the support ticket.

Collecting Additional Information

Required information:

- Hardware used
- Qulu components and drivers versions
- External Libraries versions.

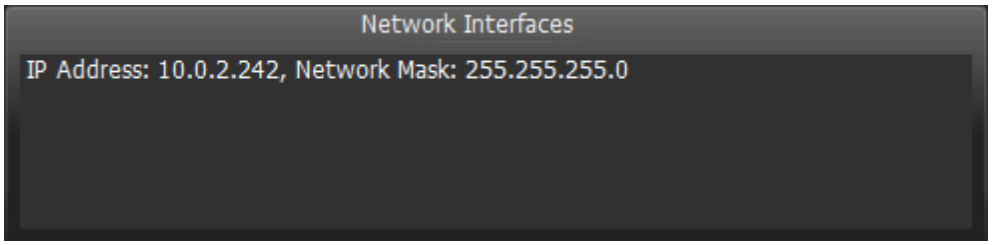
To obtain this information, open Main Menu and select *About* (or press ***F1***). The following form will appear:


About
Information
VMS Demonstration Client version 2.2.0.0 (04aebacad0b3+).
Built for windows-x64 with msvc2012u3.
Credits
VMS Demonstration Client uses the following external libraries:
Qt v.5.2.1 - Copyright (c) 2012 Nokia Corporation.
FFMpeg 0.11.4 - Copyright (c) 2000-2012 FFmpeg developers.
Color Picker v2.6 Qt Solution - Copyright (c) 2009 Nokia Corporation.
LAME 3.99.0 - Copyright (c) 1998-2012 LAME developers.
OpenAL 1.1 - Copyright (c) 2000-2006 OpenAL Community.
SIGAR 1.7 - Copyright (c) 2004-2011 VMware Inc.
Boost 1.54 - Copyright (c) 2000-2012 Boost developers.
Bespin style - Copyright (c) 2007-2010 Thomas Luebking.
GPU Details
OpenGL version: 4.2.0 - Build 10.18.10.3277.
OpenGL renderer: Intel(R) HD Graphics 4600.
OpenGL vendor: Intel.
OpenGL max texture size: 16384.
Connected servers
Enterprise controller version 2.2.0.5969 at 192.168.0.172:7011.
Media Server version 2.2.0.0 at 192.168.0.253.
Media Server version 2.2.0.5969 at 192.168.0.172.
Copy to Clipboard
Close

The information on network configuration is also important and should be provided to **Support Team** in addition to other details.

This information can be acquired by standard Windows tools (i.e.) **ipconfig**, but Qulu provides a much more simple and intuitive way.

To obtain network configuration, open Main Menu and choose *System Settings*. Network configuration is displayed the *Network Interfaces* section of the *General* tab:



Glossary

Qulu Server Components – Qulu Media Server and Enterprise Controller.

Administrator – a user that configures Qulu.

Archive – video and audio data recorded from cameras.

Aspect Ratio (AR) – video dimensions. Most commonly used are: 4:3 and 16:9.

Bitrate – number of bytes per second. Used to measure video stream.

Client – the software used to connect to servers and view video streams.

Codec – video or audio compression.

Dual Streaming – enables a camera to provide two separate streams simultaneously, yielding bandwidth and processor savings on Client (see RADASS).

Export – allows to export a video footage from archive. Exported video can be viewed on any device.

FPS – Frames per Second. Used to measure video stream.

GPU – Graphic Processing Unit. The processor installed on the video card.

HTTP – Hyper Text Transfer Protocol. Some cameras use this protocol to stream video.

Item – video or image on Scene.

Layout – saved video items and their position, size and orientation.Used to present surveillance information to Qulu user.

Live – ability to view cameras live in real-time mode.

Media Server Port – used by **Media Server** to process requests for recorded fragments and video data from Qulu Client.

Motion Detection – indicates whether or not any motion occurred within camera's viewing zone.

Motion Mask – the area in viewing zone that does not trigger **Motion Detection**.

Multi-Video Export – an ability to backup several videos in a proprietary format or executable bundle.

Onvif – a unified protocol used for communication with cameras. See http://www.onvif.org/.

OS – Operating System.

Preview Search – breaks down a period of time into smaller video segments. Example: a month broken into ten 3-day periods displaying them as separate video segments. Eases search of large archives.

Private (cameras) Network – the network used to transmit data from cameras to Media Server. It is not accessible from outside.

Public (Intranet) Network – the network used to connect to Media Server from outside. It can be used for either connecting Media Server to Enterprise Controller or configuring Server Components. It may or may not be connected to the Internet.

Public IP – IP Address that can be accessed from the Internet.

PTZ – Point, Tilt, Zoom (a camera must support PTZ for the feature to be used)

Resources – cameras, Media Servers, local video files, users and layouts.

RADASS – Resolution and Algorithmic Data Adaptive Scaling System. Enables dynamic switching of resolution to yield bandwidth savings and optimize processor load. Requires **Dual-Streaming** to be supported by the Cameras used.

RTSP – Real Time Streaming Protocol. Some cameras use this protocol to stream video.

RTSP Port – the port used by Media Server to process requests for media streams from Qulu Client.

Server – the computer that Qulu Media server is installed on.

Smart Motion Search – an ability to search by motion within the selected range. Qulu will provide fragments with motion occurred in the specified region.

Super Administrator – an initial user with full access to Qulu (his login is **admin**). This user cannot be deleted.

Sync – ability to play back several cameras simultaneously.

Thumbnails – small snapshots of recorded footage. Used in searching for specific scenes.

URL – Uniform Resource Locator is a specific character string that constitutes a reference to an Internet/ Intranet resource. Used to establish connection to Enterprise Controller.

Viewer – a user with a limited access to Qulu (not permitted to change configuration).

Watermark – used to check validity of exported files. If a file was modified or altered in any way, watermark will fail.

CONTACT US:

support@vista-cctv.com